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Nature in Avon

Volume 67

Bristol Naturalists' Society

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Further information is available on the Society's website

Front Cover. Adder's-tongue Spearwort in full bloom. H Willmott.
See page 23

Editorial

As the Society approaches its 150th birthday it properly looks, Janus-like, both forward and back. 2007 was the year in which the government revived interest in a barrage across the Severn, and the Sustainable Development Commission report in October condemned the idea as being part of the problem rather than the solution. The Society ran a series of events and articles to raise awareness of the huge international significance of the estuary. It was also the year in which the Natural Environment and Rural Communities Act came into force, imposing a duty on all public authorities to consider the importance of biodiversity when making decisions, though what this will mean in reality remains to be seen. It was the year in which the madness of building an economy on the basis of more or less unlimited credit rather than relying on saving finally became obvious, and in which the rise in the price of oil, as demand began to exceed supply, began to have a real impact on the price of everything else. Whether, as some believe, this is a turning point in modern history, or just a blip in the ever upward march of economic growth, time alone will tell.

The function of this society is to record and monitor the natural environment, and the endless pattern of change, which is partly natural, and partly a consequence of human actions. The impact of the warmest April since 1893, and record rainfall during the months of May, June and July is recorded with precision. We were fortunate that there were no floods in Bristol largely because some appropriate actions had been taken after the disaster of July 1968, but the fundamental cause of the problems nation-wide was not the rainfall (no monthly records were broken) but the draining of mountain tops and the spread of concrete across the suburbs.

This volume includes a good deal of botany. There is Botanical Report for 2006, which arrived too late for inclusion in last year's journal, a detailed article about Adder's Tongue Spearwort, and a detailed list of the Liverworts of the Avon Gorge, which is the sort of thorough technical research that this Society has published on many occasions in the past. I have also put together three articles by Clive Lovatt, originally published in the monthly bulletin, about JW White. It also has details of two young nature reserves, Arnos Vale Cemetery and the Jubilee Stone Wood, and a piece of research on the impact on bird life of two very different water habitats. It reflects, I hope, the breadth of the society's interests.

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Weather report for 2007

R.L.Bland

2007 was an unusual year, beginning with a warm winter, followed by the second warmest spring since 1881, then the wettest three months of May, June, July ever, a cool summer and an ordinary autumn. April was sunnier than August, and 235 (64%) days had no rain.

The overall mean maximum temperature was 14.5C° which makes it the 16th warmest year since 1881. Overall rainfall was 1107mm compared with the average since 1853 of 891mm, making it the tenth wettest year since 1853.

Year	1998	99	00	01	02	03	04	05	06	2007
Avg Max C°	14.2	14.6	14.1	13.8	14.3	15.0	14.3	14.4	14.7	14.5
Previous decade avg C°	13.8	13.8	13.8	13.8	14.0	14.2	14.3	14.2	14.4	14.4
Rainfall mm	1065	1106	1250	860	1178	758	951	896	955	1107
Previous decade avg mm	942	966	1003	995	1010	978	970	954	973	997

Table 1 Decadal average mean maximum temperature and rainfall

Seasons The average for the **winter** (Dec.-Feb.) was 9.0C°, the warmest since 1998/99. Rainfall at 123mm was well above average, and the wettest since 1998/99. There were 17 frost nights (October to April), the last on March 21st. There were four nights with cold enough to create ice, and two days with snow lying. The coldest spell was from Jan. 22nd to Jan. 26th.

Spring (March-May) Temperature was 14.9C°, second only to the extraordinary 1893 (16.6C°), and caused by an extraordinary April, which averaged 17.4C° Rainfall was close to the average, but there was almost none in April, while May had 163mm, just missing the 164mm record set in 1869.

Summer (June-Aug.) at 19.4C°, was a little below average, but identical to 2002. Rainfall in June and July was very heavy, though it came in occasional downpours, and Bristol avoided the worst of the floods. August was dry. However it proved to be a disastrous breeding season for many birds.

Autumn (Sept.-Nov.) at 14.9C° was identical to spring, and a little above average, September by the largest amount. November began with four frost nights, but became progressively warmer. Rainfall was below average, September being particularly dry.

Seasonal Comparisons. To put the 2007 seasonal average temperatures into perspective, Table 2 shows the seasonal temperature extremes, with their year, and the average since 1881.

	2007	Min	Max	Avg
Winter	9.0	1917 2.5	1920 10.6	7.6
Spring	14.9	1887 10.4	1893 16.6	12.9
Summer	19.4	1883 18.0	1976 23.9	20.1
Autumn	14.9	1915 10.6	1959 16.8	14.0
Annual	14.5	1892 12.1	1921 15.6	13.8

Table 2 2007 seasons average maximum temperature C° compared with minimum, maximum and average temperatures since 1881

Table 3 shows the average monthly rainfall in each season for 2007, and compares it with the extreme figure and average since 1853.

	2007	Min	Max	Avg
Winter	123	1964 21	1995 154	77
Spring	79	1893 17	1981 107	60
Summer	101	1995 11	1879 140	73
Autumn	55	1978 26	1935 173	87
Annual	1107	1864 590	1882 1253	891

Table 3 Average monthly rainfall in mm for each season in 2007 compared with maximum, minimum and average since 1853.

Monthly temperatures. Nine months were warmer than the long term average, three, June, July and August, were colder. The differences for all months were inside the normal standard deviation except for April.

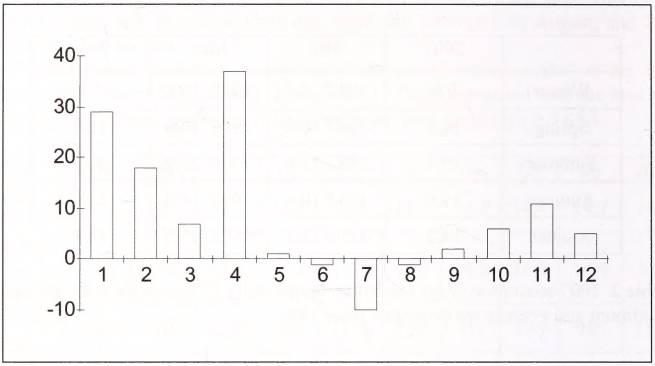

Chart 1 Monthly mean maximum temperature- percentage variation from average.

Monthly rainfall. Seven months were wetter than the long term average, five drier. January, February, May June July and December were all wetter than the standard deviation, and April was drier.

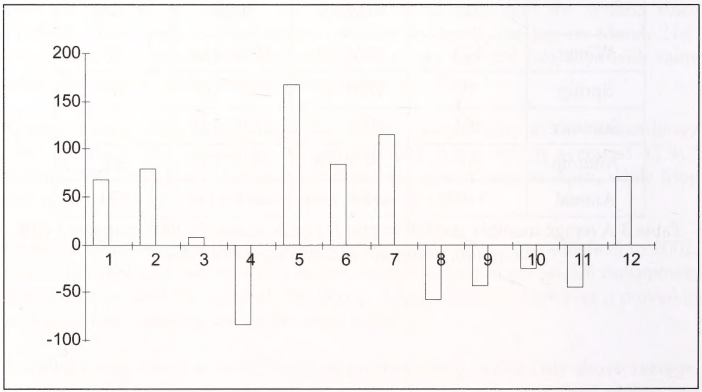

Chart 2 Monthly rainfall, percentage variation from long term average

Monthly summary 2007

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
Temp C°	9.3	9	10.8	17.4	16.5	19.1	18.8	20.3	18.4	14.9	11.3	8.3	14.5
Rain mm	139	111	65	10	163	114	153	37	46	71	49	149	1107

Table 4 2007 Monthly average temperatures and total rainfall

January 9.3C°, the warmest since 1999, rain 139mm, the wettest since 1995. Three frost nights. First three weeks dominated by west winds flowing between Iceland low and Spanish high. On 21st the wind turned North as high pressure developed over UK, and temperatures fell to 2C° on 23rd, and ponds were iced briefly. High pressure and light winds dominated the rest of the month.

February 9.0C°, the warmest since 2002, rain 111mm, the wettest since 2002. Five frost nights. Began cold, frosty and dry, dominated by east winds, culminating briefly with snow and ice on 7th-9th. On 10th winds switched to SW, and temperature rose reaching 12C° on 20th, influenced by southerly winds between low pressure in the Atlantic and high in the Baltic. The last week saw strong W winds.

March 10.8C° the warmest since 2003, rain average at 65mm. 2 frost nights. Began with a wet week and strong SW winds, and temperatures around 12C°. On 19th winds switched to N, and remained there or easterly for the rest of the month, controlled by a Baltic high. This created some very bright days (10 hours of sun on 27th and temperatures that fell to 5C° on 20th but recovered to 14C° (for the first time) on 26th.

April 17.4C°, the warmest since the record 1893 (17.9C°), rain 10mm, the driest since 1984 (3mm). Sunshine hours averaged 7.6hr a day, the sunniest since 1997, and 2.5 hrs a day above average. No frosts. Entirely dominated by high pressure, with very light winds, though mostly from the east. Temperature reached 18C° on 2nd and 21C° on 14th and 30th. Ten days had more than eleven hours of sunshine.

May 16.5C°, (most unusually colder than April), an average month, rain 163mm the second wettest year to 1869 (164mm). Included wettest week (7-13th) since Nov 2000 (156mm), when 117 mm fell. Began hot and dry with NE winds but low pressure systems dominated from 6th with strong SW winds, no sun, and temperatures falling to 14C° on 9th, 13th and 16th. On 21st winds switched to N round a ridge and temperatures reached 21C° briefly on 23rd, 24th before falling to 11C° on 27th, with N winds and 17mm of rain.

June 19.1C° close to average, but coldest since 2002. Rain 114mm, wettest since 1998. This included 26mm falling in an hour on 19th, and the second wettest week of year with 66mm June 19-25th. Began with a warm spell, reaching 23C° on 2nd and 24C° on 10th, with light NE winds and little pressure gradient, and no rain until 13th. Two days had 12 hours of sunshine. On 14th the winds switched to S, and low pressure systems with strong SW winds swept across the country, bringing rain almost daily, and flooding to several parts of the country. Temperatures stayed around 18C° but fell to 15C° on 25th with 31 mm of rain. Sunshine average only 3.6 hours a day compared with a recent average of almost six hours.

July 18.8C°, two degrees below average, coldest since 1993, rain 153mm, the wettest since 1968, (when there was very severe flooding in Bristol) and sixth wettest since 1853. The combined rainfall for May, June and July was a record 430mm; the next highest recorded for these three months was 350mm in 1924. The whole month was dominated by a succession of depressions and westerly winds, temperatures around 19C°. Sunshine reached double figures on only seven days, and it rained on twenty days.

August 20.3C°, coldest since 1998. rain 37mm lowest since 2003. Began with a warm dry spell reaching 27C° on 5th (warmest day of the year), and light winds with little pressure gradient. On 19th winds shifted to N, and high pressure set in that dominated the rest of the month. There was a brief spell of hot weather from 22-25th with blue skies, and a top temperature of 25C°.

September 18.4C°, coldest since 2001, but just above average, rain 46mm, half average. Dominated by high pressure very light winds from N or E, warm and dry conditions. From 25th temperatures fell as cold NE winds replaced SW.

October 14.9C°, just above average, rain 71mm, below avg. Two frost nights. Dominated throughout by high pressure and light winds mainly from the east. Temperatures fell slowly. The weekly average fell below 15C° on 20th, after 28 weeks above it, three weeks longer than normal.

November 11.3C°, warmest since 2003, above average, rain 49mm, lowest since 1988, and half average. Five frost nights. High pressure continued to dominate, with no rain, and light N or NW winds to 18th, when a low pressure system brought SW winds and 42mm in three days, before high pressure returned at the end of the month.

December 8.3C°, average, rain 149mm, wettest since 1999, almost double average**.** Eight frost nights. Began with a storm and 40mm of rain on 1st, wettest day of year, and there was a further storm on 7/8th. Then high pressure returned, with frosty nights, occasional ice on ponds and light SE winds to 21st. Temperatures fell to 2C° on 16th, 20th and 21st, but low pressure and SW winds took charge for the rest of the month.

Weather Extremes.

The table below gives figures for extreme annual events over the past decade, enabling the extreme events of 2007 to be put in perspective. There seems to be no pattern in these figures, except that the number of days without any sun has increased from around 50 to around 100. It is also interesting that, contrary to common perception, two days in every three have no rain at all.
2007 had a very cool summer, but was close to the top of both the number of days with more than ten hours sun and the number of days without any sun.

		98	99	00	01	02	03	04	05	06	07	
Hottest	C°	29	30	30	30	26	32	28	30	35	27	Aug 5
Coldest	C°	3	3	3	2	0	1	3	0	0	2	Jan 23
Wettest	mm	21	28	55	55	60	45	45	47	39	40	Dec 1
Sunniest	hr	14	14	15.5	14	14.9	15.1	13.9	14.8	14.7	14.1	Aug 1
Longest dry	days								14	22	24	Ma31-Ap23
Longest wet	days								7	11	8	Ju29-Jy6
Frost	days	25	29	28	46	14	49	30	32	33	25	
Snow	days			4	0	0	0	6	2	2	2	
Storms	days								1	3	6	
>25C°	days	8	20	12	15	3	22	13	14	27	1	
<5C°	days	12	9	13	34	17	25	15	26	39	18	
>10hr sun	days	31	41	32	45	30	42	19	38	36	45	
No sun	days	59	44	51	62	78	56	90	89	107	99	
No Rain	days						263	231	248	234	238	

Phenology 2007

R.L. Bland

Phenology is the study of the impact of the weather on natural events, and I have looked particularly at plant development by doing a standards walk across the Downs each week. On these walks I record the plants in flower, the leafing of trees, the ripening of fruit, and leaf fall. The variation in dates from year to year can be compared with the temperature in the relevant preceding period. Establishing the normal relationship between temperature change and plant development at this latitude is vital to any understanding of the potential and actual impact of climate change in future.

2007 was a very remarkable year as it began with a warm winter, the second warmest spring, including the warmest April since 1893, and then a cold summer, with the largest rainfall in May, June and July ever recorded, causing widespread flooding in some parts of Britain though not in the Bristol region, and an average autumn. Table 1 compares the 2007 average temperature for each season with the long term average since 1881. The exceptional nature of the spring is clear.

	Winter	Spring	Summer	Autumn
2007	8.9	14.8	19.4	14.9
Average	7.6	12.9	20.1	14.0
Difference	1.3	1.9	-0.7	0.9

Table 1 Seasonal temperatures 2006 compared with the average since 1881.

Spring events

(In the charts that follow the dates on the Y axis are give in Julian days, ie days after January 1st. It helps to remember that April 1st is Day 90, June 30th Day 181, Nov 1st Day 305).

Chart 1 shows the average date of 13 spring events which have been well recorded since 1998. The chart does not show the full impact of the warm April because most of the events occur before April.

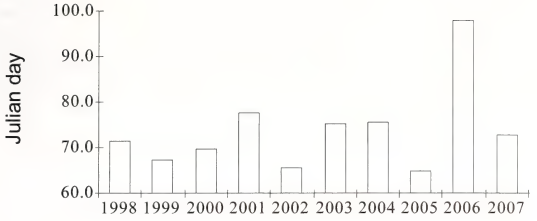

Chart 1 Average date of 13 spring events, 1998-2007

Chart 2 shows the relationship of these events to the March temperature. Roughly speaking a one degree C change in March temperature causes a six day change in the average date of events. The values for 2007 were 10.8C and Day 72. The record that does not fit the pattern was 2003.

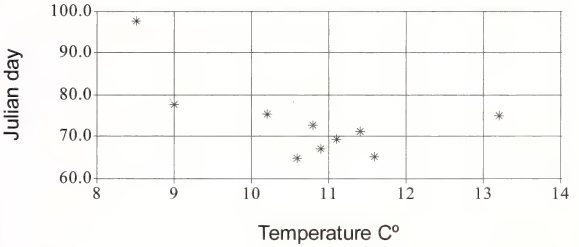

Chart 2. Relationship of March temperature to average date of spring events 1998-2007

The real impact of the April weather came later, as plants were rushed into flower earlier than normal. The contrast with the late spring of 2006 was dramatic, as species flowered came into flower three weeks to a month earlier, but the contrast with the average is shown in Chart 3. This compares the average date of all events that happened in each successive fortnight with the average date for those events over the past ten years. The vertical axis shows how many days earlier than average the events of 2007 were. By early April, week 14, events were only two days early, but by week 20, mid-May, they were over two weeks early, and even by the end of June, Week 26, they were still six days early.

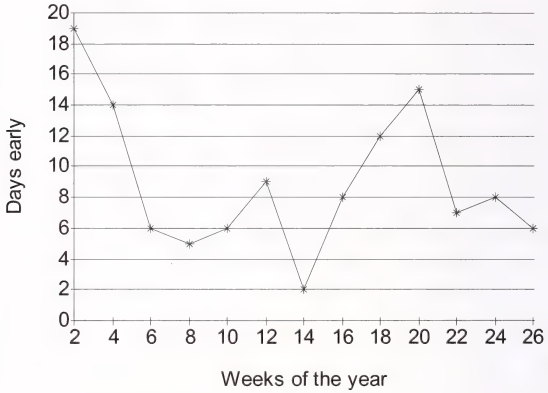

Chart 3 The number of days that events in 2007 were earlier than the ten-year average

Autumn events

Fruit ripening.. In 2007, despite the cold and wet May, June and July, athe average ripening date of 14 species was the earliest yet. The implication is that there is little relationship with weather, but a substantial one with spring flowering dates Chart 4 shows the relationship between summer weather and the time taken to ripen, ie the difference between first flower and ripening. The 2007 data, temperature 19.4 C, ripening time 125 days, is on the left side of the chart. 2006, a hot summer, is bottom right.

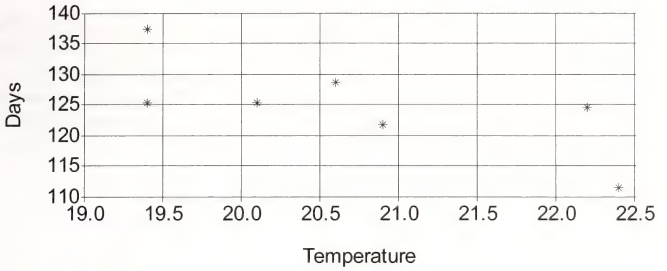

Chart 4. Ripening dates for 10 species, 2001-2007 compared with summer (May-July) temperature.

Leaf fall

Chart 4 shows the relationship between the average date when 18 local tree species became bare and October temperature. In2007 the average date was Nov 6th (Day 310), eight days earlier than the overall average for the previous five years of Nov 14th (Day 318). The figures suggest that a one degree alteration in October temperature produces a five day change in the date of leaf fall. However the 2007 figure, temperature 14.9C, date Day 310 is a week earlier than in theory it should be.

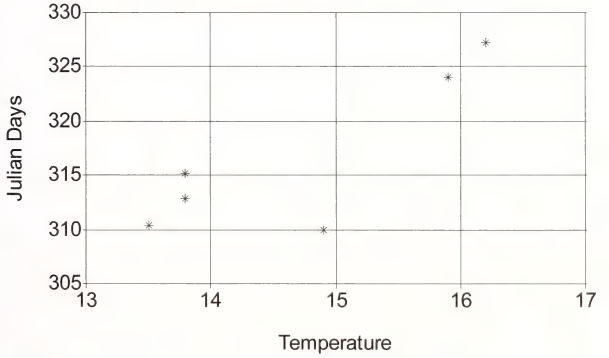

Chart 5 Relationship between October temperature and the average date of trees becoming bare, 2001-6

Tree active life.
By comparing the average date of bud burst with the average date of becoming bare one can calculate the average active life of tree species. The average active life of 11 species in 2007 was 220 days, the shortest yet recorded, largely because of the early leaf fall, since the spring was early. In 2005, the best recent year, the 11 species had an average of 249 days active life. Chart 6 suggests a relationship with spring temperature. The 2007 values are Temperature 14.9C° and 220 days. The anomalous figure on the left is for 2006.

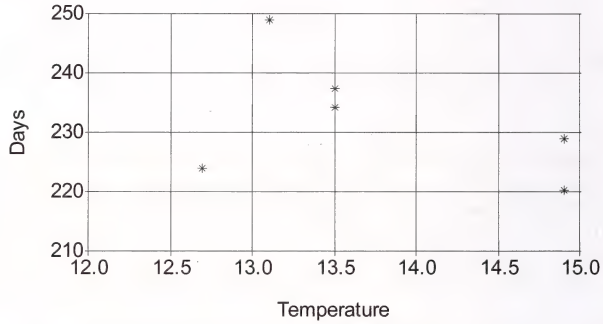

Chart 6 Relationship between spring temperature and the number of days of active life for 11 tree species, 2002-2007

Winter Survival.
A New Year's Day count on the Downs revealed 22 species still in flower, five of them not seen before since the survey began in 2000. It increases the number of species seen in flower at the end of the year to 40. Of the total only four have been in flower every New Year's Day and another four on seven occasions. 17 have only been seen once, and four species are spring flowers rather than winter survivors. Chart 7 shows the relationship of autumn temperature to the number of species in flower.
During the last five winters 13 species have been found in flower on the Downs for the full six winter months October to March, but only two of them, Daisy and Gorse have been found flowering throughout all five winters. The other species are Green Alkanet, Dandelion, Adria and Trailing Bellflower, Ivy-leaved Toadflax, Petty Spurge, Mexican Daisy, Sow Thistle, Red Valerian, Groundsel and Shepherd's Purse.

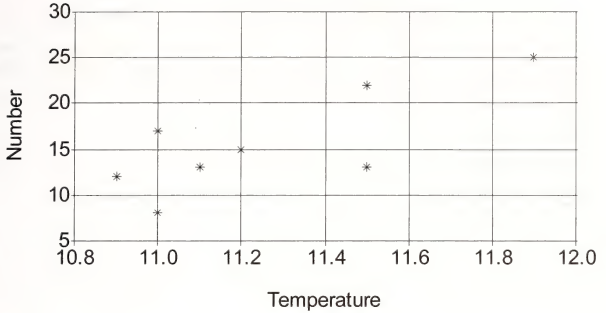

Chart 7 Relationship between the number of species in flower on the Downs each New Year's Day 2000-2006 and the autumn temperature.

Plant first flowering dates.

Autumn and winter temperature clearly controls first flowering dates, and these are not well recorded, so in 2007 a serious attempt was made to gather as many such dates from the whole region as possible. Because April 2007 was so exceptional it is likely that the dates of most species after mid-April will stand as early records for many years. In all dates were gathered for 435 species, and it is hoped to check them in future years, and to add rarer species. As climate changes so these dates will change, and the impact of the climate on plant life will be able to be measured with accuracy.

Arnos Vale Wildlife

Mary Wood
marywood@talktalk.net

Arnos Vale Cemetery, after years of neglect and vigorous campaigning, is finally beginning an extensive programme of restoration which will give back to Bristol one of its most important sites for people, history and wildlife.

Glancing in at Arnos Vale's Bath Road entrance, the magnificent amphitheatre of the Arcadian garden is striking, with its Grecian style buildings and fine planted trees. The trees forming the backdrop have appeared more recently, but 1837 to 1839 saw the formal landscape being laid out (the specimens provided by Garraways Nursery in Clifton), including an avenue of Irish Yews (*Taxus baccata 'fastigiata'*), 2 Austrian Pines (*Pinus maritima*), Western Red Cedar (*Thuya plicata*), a Monkey Puzzle or Chilean Pine (*Araucaria araucana*) and a Deodar or Himalayan Cedar (*Cedrus deodara*). Arnos Vale must have been very fashionable as this tree had only been introduced to England a couple of years earlier. There are many other outstanding trees including English Yews (*Taxus baccata*) (the bright red aril is, confusingly, the only part of the tree that isn't poisonous), veteran Horse Chestnuts (*Aesculus hippocastanum*) and English Oaks (*Quercus robur*). Behind the Anglican chapel, 2 weeping Ash trees (*Fraxinus excelsior* cv 'Pendula') twist and weave their drooping branches; it is likely that these trees are the source of thousands of ash (*Fraxinus excelsior*) saplings which, together with those of Sycamore (*Acer pseudoplatanus*), have turned most of the 45 acre site into secondary woodland over the past twenty to thirty years, suppressing the plants and reducing the variety of wildlife.

Lying on Mercia Mudstone, the soils have weathered to produce a slightly calcareous soil. On the south-east facing slopes in the north-west of the site and along pathways in this area, a remnant calcareous flora is still hanging on, with indicative species such as Glaucous Sedge (*Carex flacca*), Ladies Bedstraw (*Galium verum*), Field Scabious (*Knautia arvensis*), Common Restharrow (*Ononis repens*), Rough Hawkbit (*Leontodon hispidus*) and Bird's-foot Trefoil (*Lotus corniculatus*). This is the CG3 *Bromopsis erecta* grassland of the *Festuca rubra* sub-community. Grant-aided work began in winter 2006/7 to remove shading trees from this and other areas so that the interesting botany can flourish and spread. Common Valerian (*Valeriana officinalis*) also grows in this area. Much of the rest of the grassland had become neglected and rank, forming MG1 *Arrhenatherum elatius* grassland of the *Festuca rubra* sub-community. It is hoped that an annual meadow cut will gradually improve the diversity of these grasslands, which support Meadow Vetchling (*Lathyrus pratensis*), Bush Vetch (*Vicia sepium*), Lesser Stitchwort (*Stellaria graminea*) and Common Cat's-ear (*Hypochaeris radicata*). Locally notable species at Arnos Vale include scaly Male Fern (*Dryopteris affinis*), Hard Shield Fern (*Polystichum aculeatum*), Zigzag Clover

(*Trifolium medium*), Spiny Restharrow (*Ononis spinosa*) and Common Cornsalad (*Valerianella locusta*).

As well as the inevitable removal of some more mature trees for health and safety reasons and to protect the precarious listed walls from faster deterioration, tree thinning also took place in areas that have become so wooded that they will continue to be managed as woodland. Already Primroses (*Primula vulgaris*), Wild Garlic (*Allium ursinum*), Lady's Smock (*Cardamine pratensis*) and Goldilocks Buttercup (*Ranunculus auricomus*) have begun to spread. The locally rare Deadly Nightshade (*Atropa belladonna*) used to occur, but it hasn't re-appeared yet. The nationally scarce Ivy Broomrape (*Orobanche hederae*) grows well at Arnos Vale. This species is fairly common in the south-west of Britain because this is the location of its host Atlantic Ivy (*Hedera helix* ssp. *hibernica*). Partly due to lack of funding, some parts of the cemetery that are less visited or very unsafe will be left as wilderness, where bramble thickets and old trees benefit invertebrates and nesting birds.

It was possible until recently to disturb wintering Woodcock, and Firecrests have been regulars most winters. Perhaps because migrating birds follow the river, or just because they see Arnos Vale as a large green space amongst the rooftops of south Bristol, spring birding can provide many surprises such as Wood Warbler, Spotted Flycatcher, reeling Grasshopper Warbler, Cuckoo and Lesser Whitethroat. These have all been recent visitors, the latter staying on to breed in 2006. Summer visiting Whitethroats, Blackcaps and Chiffchaffs join the resident thrushes, finches, tits, Jays and Great Spotted Woodpeckers to bring the total of bird species breeding at Arnos Vale to twenty three. Buzzards can be seen tumbling and wheeling over Totterdown thanks to the cemetery, and Sparrowhawks too. Perhaps oddly, Nuthatch and Treecreeper are only rare visitors.

Three hundred and seventy five species of invertebrates have been recorded, of which twenty seven are nationally notable. The grasslands are the most inhabited, but particularly important is a stand of white poplars where 4 Red Data Book and 4 nationally scarce species were found. A leaf-mining fly *Agromyza viciae* and another fly *Leiomyza* sp. were new records to Britain (despite the former's reliance on bush vetch which is a widespread plant). Tall herb vegetation supports the unusual bumble bee *Bombus rupestris* and Arnos Vale probably has the largest population of this species in Bristol. Butterflies (twenty five species were recorded in the past), hoverflies, bees and other insects benefit from the late flowers of ivy which will be partially left on the tombs and trees unless damage is occurring. In invertebrate terms, Arnos Vale compares very favourably with other nature reserves in Bristol and this diversity, along with that of the rest of its wildlife, has led to its designation as a Site of Nature Conservation Interest under the Bristol Local Plan.

The stunningly beautiful and varied monuments were constructed using many different rock types, providing substrate (especially limestone and sandstone) for colonisation by over eighty lichen species, including several that are uncommon in the Bristol area. Interestingly most colonies are fairly recent, being 8 to 12 years old at most, suggesting an improvement in Bristol's air quality.

The European protected Common Pipistrelle, Noctule, Brown Long-eared and Serotine bats feed among the trees in small numbers. Lesser Horseshoe Bats have found their way into the neglected buildings, which have become a small winter roost for this species, unusual in a city. The creativity of the bat consultant and the architects (under a licence from Natural England) should ensure that lesser horseshoe bats continue roosting at Arnos Vale after restoration (aimed for completion around the middle of 2009).

There are three populations of the harmless legless lizard, Slow-worm, which benefit from the mix of long and short grass and scrub. These require that the August meadow grass cut be no shorter than 15cm to avoid injuring them (they are protected under the Wildlife and Countryside Act 1981). Instructions to the grass cutters to pick them up just behind the head will avoid them being left with a wriggling tail in their hands!

As the dense, drawn secondary woodland gives way to open sunny slopes, sunlit glades and damp wooded darker places, the restoration of Arnos Vale should lead to more wildlife discoveries and re-appearances. Feel free to visit and explore on your own or you might prefer to join a guided walk. The information is available on the website www.arnosvale.org.uk . The Trust is extremely grateful for the generous BNS donation last year. The project still has some way to go to reach its fund-raising target; if you would like to help in securing the future of this unique site, contact Mary Wood on 0117 9721079.

Jubilee Stone Wood Nature Reserve
Backwell, North Somerset

IR Chambers
chimpychambs@yahoo.co.uk

Jubilee Stone Wood Nature Reserve was purchased in 2005 by the Backwell Environment Trust (BET) with the objectives of protecting the wood from possible development, increasing the biodiversity of the site and educating the public in the conservation of their natural environment. The reserve consists primarily of semi-natural broadleaved woodland interspaced with small patches of unimproved, species rich, limestone grassland.

The 4 hectare woodland is situated on the top of Backwell Hill (grid ref: ST 495681 to 502677) at a maximum altitude of just over 155 metres and offers extensive views over the surrounding countryside. The Jubilee Stone, a large granite plinth and obelisk, was erected to commemorate Queen Victoria's silver jubilee in 1887 and ever since that date, records of successive royal coronations and jubilees have been added.

Local History

The maps of the locality dating back to the 1800s show that what is now woodland was previously rough pasture with little in the way of tree cover. The area was continually grazed up until the 1900s when the upper, flatter part of the hill was operated as a golf course. During the Second World War the land was ploughed for grain production which had the effect of removing most of the scrub, gorse and bracken. After the war, the land reverted back to rough grazing until the winter of 1961/62 when the site was fenced to exclude livestock animals, allowing the landscape to develop to what we see today.

Geology

The Carboniferous limestone of Backwell Hill was formed from the deposition of calcium carbonate by mats of algae spreading across the floor of a warm, shallow lagoon about 350 million years ago when the British Isles straddled the equator. The hill is bordered to the west by Cheston Combe which is one of a series of steep-sided dry valleys orientated north-west to south-east starting with Goblin Combe in the west and ending with Bourton Combe in the east. All of these valleys were carved out by large quantities of water flowing over and through the limestone in earlier geological time periods.

The nature reserve contains a linear seam of galena (lead sulphide) which has been mined in recent history. Numerous examples of the open cast workings (often referred to as 'bell-pits') together with the remains of subterranean mineshafts are still clearly visible in the woodland today. Deposits of yellow ochre (a hydrated form of iron oxide) have also been unearthed on the reserve. Although this mineral has been

identified as being mined in the locality in antiquity we have to date discovered no evidence that this mineral was extracted from the reserve site.

Archaeological Features

The most obvious industrial feature on the reserve is an exceptionally well-preserved lime kiln. Historical evidence from old maps indicates that it was constructed sometime between 1843 and 1884 and subsequently abandoned sometime between 1884 and 1902. Tree cover on Backwell Hill during this period was sparse so it would probably have been fuelled by wood from other local woodlands or from coal deposits extracted from around the village of Nailsea. It would have utilised the local limestone and the reserve has several square shaped pits adjacent to the kiln where stone has clearly been removed. The 'quicklime' (calcium oxide) it produced was hydrated and either used in agriculture for neutralising acid soils or on buildings as a lime mortar or external lime-wash.

The only known settlement on the reserve was a cottage and garden first recorded on the 1789 estate map and marked as 'Warren Lodge'. An earlier map of 1709 shows that there was a rabbit warren on Backwell Hill with another reference dating from 1318 suggesting that the warren may have been in continuous use since the Middle Ages. The cottage, now in ruins, would have originally covered an area of about 40 sq. metres with an adjacent garden of about 1200 sq. metres.

Soil Composition

The overlying soil pH on the reserve is generally within the range 6.5 to 7.5 (neutral pH). However, one section of the reserve exhibits a soil pH of around 5.7 allowing a 'limestone heath' flora to develop that has included Common Gorse (*Ulex europaeus*) and Bell Heather (*Erica cinerea*). Research on the soils of Dolebury Warren has suggested that the areas of limestone heath on this reserve were associated with pockets of acidic soil remaining from a formally widespread covering of Ice Age windblown 'loess' which has since been eroded away, primarily due to man's activities since Neolithic times. Additionally, acidic glacial clays have been recorded in-filling limestone hollows within 1km of the Jubilee Stone Reserve so it seems likely that either one or both of these processes has had a major influence on the formation of the pockets of acid soil we observe today.

Woodland Trees

Jubilee Stone Wood can be divided into two distinct regions:

1. The lower section of the woodland contains appreciably more mature trees than the upper sections of the reserve and has clearly been woodland for some period of time. The first 1:1,250 scale Ordnance Survey map of the area published in 1884 records all trees in the locality as either being coniferous or deciduous. Some of the trees marked on this map are still in existence today and include mature specimens of Ash (*Fraxinus excelsior*), Beech (*Fagus sylvatica*), Common Lime (*Tilia x europaea*) and Yew (*Taxus baccata*). The ground flora also includes a number of ancient woodland

indicator species including Dog's Mercury (*Mercurialis perennis*), Bluebell (*Hyacinthoides non-scripta*), Wood Anemone (*Anemone nemorosa*) and Ramsons (*Allium ursinum*). After livestock were excluded from the wood during the early 1960s, an under-storey primarily of Hawthorn (*Crataegus monogyna*) and Ash has developed which has now shaded out all of the summer flowering plants and is now affecting the successful propagation of the spring-flowering species. Selective removal of these trees is now taking place which will increase light levels on the woodland floor, allowing spring flowering plants to flourish once more.

2. The upper sections of the woodland typically contain trees between 20 to 45 years old and comprise mainly Hawthorn, Ash, Pendunculate Oak (*Quercus robur*), Whitebeam (*Sorbus aria*), Hazel (*Corylus avellana*), Turkey Oak (*Quercus cerris*) and Holly (*Ilex aquifolium*). The older, mature trees in this section of the woodland are mainly Ash.

Increasing Biodiversity

Since acquiring the site, the first year's work was essentially devoted to surveying and recording the plants and animals present on the reserve and removing the large quantities of litter that had accumulated over many years. These surveys identified a moderate range of flora and fauna but also indicated that large sections of the reserve had been overtaken by Hawthorn thicket, garden escapes, Bracken (*Pteridium aquilinum*) and to a lesser extent Bramble (*Rubus fruticosus*).

Commencing in October 2006, the first of a series of woodland management projects was undertaken on the reserve, focusing on reducing the levels of invasive and non-native plants, restoring habitats lost to scrub and also creating new habitats.

Invasive Species Control

A large area in the south-east corner of the reserve was dominated by Box Honeysuckle (*Lonicera nitida*), a garden escape commonly used as a hedging plant. Initially our approach was to dig out as much of the root system as possible but this technique proved to be only partially successful as the plant quickly regenerated from any remaining sections of root left in the ground. During the spring/summer of 2007, the plants were cut off close to the ground and the stumps treated with a low impact, systemic herbicide ('Garlon 2'). This approach has proved to be much more successful and should enable us to completely eradicate this invasive, non-native plant from the reserve over the next few years.

Large areas of grassland on the upper sections of the reserve were initially inundated with dense glades of Bracken, often found growing up to two metres high. Bracken is a native fern but since the land was fenced off to livestock, it has been allowed to grow unchecked and consequently it has had a highly detrimental effect on the survival of almost all grassland plants attempting to grow beneath its dense shade. Our aim therefore was to remove approximately 95% of the Bracken, preserving the remainder around the edges of glades to serve as cover for birds and insects. Starting in 2007,

Bracken and it's subsequent re-growth, was both pulled and 'bashed' five times between May and September which will have had the effect of seriously weakening the plant. Our aim is to continue with this treatment, hopefully eradicating the majority of this fern from the grasslands by the autumn of 2009 which will allow other species to start to re-colonise the newly cleared areas.

Turkey Oaks were introduced into England in 1735 from southern Europe and have spread rapidly especially on the well drained, dry soils commonly found overlying limestone. They have grown particularly well on the reserve often producing a dense shade that has restricted the growth of other native trees and plants. Where these trees are having a detrimental effect on adjacent native species they have been either felled or ring-barked and treated with herbicide to be retained as standing dead wood. As these trees slowly decay they will provide a valuable habitat that should benefit a wide range of wildlife including fungi, insects, birds and bats. Fortunately Turkey Oaks coppice well which gives us the opportunity to retain this species on the reserve (albeit now under strict control) should climate change eventually lead to the demise of our own native oaks in the future.

Habitat Restoration

One example of a major project that was undertaken during the winter of 2006/7 was the restoration of a 0.2 hectare section of dense Hawthorn scrub to species-rich grassland. The project also involved the laying and planting of a hedgerow, together with the introduction of coppicing and pollarding techniques to the woodland. The meadow, even in the first year of growth, has well exceeded our expectations. We have identified over one hundred species of flowering plants now present in the newly created meadow that were not recorded prior to the removal of the scrub cover. The sheer number of flowering plants that have germinated is extraordinary considering that a proportion of these seeds must have remained dormant in the soil for over forty years before the micro-climate was radically altered with the removal of the scrub cover. This shift in the local atmospheric conditions may well have contributed to the re-emergence of a saprophytic plant, the Yellow Bird's-nest (*Monotropa hypopitys*), occurring directly opposite the newly created meadow. This rare plant was last recorded in the Backwell area in 1988 with the nearest other specimen being recorded (although not now seen for some years) on Avon Wildlife Trust's Brown's Folly reserve east of Bath.

Fauna

In the spring of 2007 a Common Dormouse (*Muscardinus avellanarius*) hibernation nest was discovered on the reserve which led to an appraisal of the woodland by the Avon Wildlife Trust which confirmed that the upper portions of the reserve in particular were prime habitat for this arboreal species. This section of the woodland contains just the right balance of young, interlinked canopy trees and lower level scrub which is necessary as the food sources of the dormouse change with the advancing seasons. Woodland management in this area is now focussed on maintaining and expanding the existing habitat of this rare, nocturnal mammal.

Other mammals of importance using the reserve include six species of bat that have been identified from the analysis of their echo-location frequencies. Both the increasingly rare Lesser and Greater Horseshoe Bat (*Rhinolophus hipposideros* and *R. ferrumequinum*) have been recorded foraging over the reserve and adjacent agricultural fields.

Local people have told us that Adders (*Vipera berus*) were once a common sight in the more open areas of the woodland but, probably as a result of the loss of their habitat, had not been observed for some years. However, after the selective scrub removal performed during the winter of 2006/7, numerous clearings and south facing sheltered 'scallops' were created that suited both the Adder and their prey species which has now led to these reptiles being seen almost on a daily basis during the summer months. Slow-worms (*Anguis fragilis*), Grass Snakes (*Natrix natrix*), Common Frogs (*Rana temporaria*) and Common Toads (*Bufo bufo*) are also resident on the reserve and are regularly seen. During the winter of 2007/8 a pond is being created which will serve both as a valuable habitat for amphibians and as a source of much needed drinking water for all other species in what can otherwise be dry, limestone terrain.

The creation of numerous warm, sheltered glades within the woodland has benefited many species of butterfly. Widespread species found on the reserve include the Gatekeeper (*Pyronia tithonus*), Meadow Brown (*Maniola jurtina*), Common Blue (*Polyommatus icarus*), Ringlet (*Aphantopus hyperantus*), Comma (*Polygonia c-album*), Small Tortoiseshell (*Aglais urticae*) and Red Admiral (*Vanessa atalanta*). It is hoped that, over the next few years, the woodland management work performed so far will continue to favour these colourful insects, resulting in an increase in both number and species count on the reserve. One butterfly present of particular note is the Silver-Washed Fritillary (*Argynnis paphia*). Almost the entire reserve has a prolific ground flora of the Common Dog-Violet (*Viola riviniana*) which is the principle food source of the caterpillar of this species. After the clearance of encroaching scrub, these plants are thriving so over the coming years we are hoping to record larger numbers of this increasingly scarce butterfly and even encourage other members of the fritillary family to take up residence.

The establishment of a nature reserve in Jubilee Stone Wood was only started in the spring of 2005 yet even in this short period of time, selected woodland management projects have already re-established an amazing diversity of plants and animals. Looking to the future, we have commissioned a 20-year management plan that will help us focus our longer term projects more effectively over the coming years. This, together with regular species monitoring, will enable us to evaluate the effects of any changes we make on wildlife numbers so we can ensure they will support our aims of increasing biodiversity across the reserve.

Jubilee Stone Wood has a public bridleway running the entire length of the woodland together with various permissive paths. The nature reserve is open all year.

A Study of the Status, Threats and Conservation Measures of Adder's-tongue Spearwort (*Ranunculus ophioglossifolius)* at Inglestone Common Pond, South Gloucestershire

Hazel Willmott
mondeojohn@hotmail.com

Introduction

When I first moved to Inglestone Common in summer 2001, I was intrigued by the people wandering around the small pond opposite, clearly searching for something! My neighbours informed me that it was the rare Adder's-tongue Spearwort which grows both in this pond and at Badgeworth Nature Reserve. My interest was aroused and a few years of searching in vain made me decide that when I needed a project for my course at Oxford University in 2007, I would focus on this species.

What is Adder's-tongue Spearwort?

Adder's-tongue Spearwort belongs to the family Ranunculaceae and is one of the marsh-loving Spearworts. It takes its species name from the cordate basal leaves that resemble a snake's tongue (Briggs, 2005). *Ranunculus* means little frog and refers to the amphibious habitat of many of the species while *ophioglossifolius* may mean snake's tongue (Plantlife, 1999). It resembles the Lesser Spearwort *R. flammula*, but can be distinguished from this species by having glossy upper sides on the leaf (Holland, 1977).

Wet meadows and ponds are a habitat that is disappearing from our landscape as a result of arable conversion and building development. The flora associated with them is declining and *Ranunculus ophioglossifolius* is one of the vanishing plants.

Status and Protection

Adder's-tongue Spearwort is a rare marsh buttercup, classified as Endangered under the IUCN Red Data Book list and is now known from only two sites in England, Inglestone Common Pond, South Gloucestershire and Badgeworth Nature Reserve, Gloucestershire. Local status in Avon 2000 was one in 1km square (Flora of the Bristol Region 2000). The pond at Inglestone Common is part of the Lower Woods SSSI. Adder's-tongue Spearwort is also protected by Schedule 8 of the 1981 Wildlife and Countryside Act. Badgeworth Nature Reserve is an SSSI designated in 1965 by the then Nature Conservancy Council (Holland, 1977).

The Nature Conservancy Council's Recovery Programme included actions to rehabilitate the two main sites, but this initiative was not followed through to the U.K. Biodiversity Action Plan (BAP) or the Gloucestershire County BAP (Briggs, 2005). The species is, however, included in the South Gloucestershire BAP and also covered by Natural England's Species Recovery Programme implemented by Plantlife's 'Back from the Brink' programme. Inglestone Common Pond has a Species Action Plan written by South Gloucestershire Council and Plantlife. A

Management and Monitoring Plan has been written by Clare Guy for Badgeworth Nature Reserve (Guy, 2004a and b).

Biology

So what does this elusive 'little buttercup' look like? The cover photo shows it in full flower. It is tiny with canary yellow flowers, 5-9mm across with five petals that do not overlap. See Plate 1. *R.. ophioglossifolius* is an overwintering, branching annual with varying heights, 5-6cm, and has distinctive chordate basal leaves which can be found floating on the surface of the water in winter. See Plate 2. The stem leaves are more ovoid than its close relative, *R. flammula*. The achenes of *R. ophioglossifolius* are bordered and shortly beaked and covered with small tubercles unlike *R. flammula* which are smooth. An average wild plant of Adder's-tongue Spearwort produces 2,500 seeds. There is no active dispersal mechanism in *R. ophioglossifolius* and it does not hybridise with other species.

Habitat

R. ophioglossifolius grows in disturbed muddy ground around the edges of semi-permanent ponds and marshes and also in the deeper water in summer. Ponds usually dry out in the summer and become flooded in winter and thus support both aquatic and marsh plants in the wet stage and waste ground annuals in the dry areas (Holland, 1977). It is often found associated with Water Forget-me-not, *Myosotis caespitosa* and Clustered Dock, *Rumex conglomeratus* (Frost and Dring, 1971).

The growth of Adder's-tongue Spearwort is often prevented by thick mats of plant litter and Floating Sweet-Grass, *Glyceria fluitans* and clearance of this results in rapid germination and growth (Holland, 1967; Van der Valk, 1986). Competition from other dicotyledonous plants affects the performance of *R. ophioglossifolius* and monocotyledons usually out-compete Adder's-tongue Spearwort. Its growth is therefore improved by grazing cattle, which poach the ground creating bare patches for seed germination. Seed is brought-up from the seed bank by the poaching as well as the previous year's seed being pushed down into the soil to germinate.

Conditions of Growth

Adder's-tongue Spearwort is very particular about optimum conditions for growth and this, with other variables, may account for the changes in abundance. The vagaries of British weather do not always offer ideal conditions, which are highlighted below:

Bare soil and moist ground from August to October for seed germination (Holland, 1977). The optimal temperature for seed germination is 15ºC (Frost, 1971). Seed will not germinate under water.

A mild frost-free autumn with sufficient rain until the end of October to keep the ground moist enabling young seedlings to grow a basal rosette of leaves. Seedlings are very vulnerable at this stage to trampling by stock or being killed by competing vegetation (Holland, 1972).

Adequate rain in November and December to fill up the pond and submerge the plants. Early flooding to a depth of at least 30cm is essential to protect the seedlings from predations, (e.g. slugs and birds) and allow development to continue. The plants respond to submergence by rapid elongation of the petioles so that the basal leaves reach the top of the pond where they spread out and float on the surface like little water lily leaves. This effectively shades out other aquatic competitors and allows *R. ophioglossifolius* to flourish (Dring, 1964; Holland, 1977).

Absence of prolonged severe frost. If the floating leaves are encased in ice they die, but as the apical growing point of the plant is well below this, the plant will survive (Dring, 1964). This can give *R. ophioglossifolius* a competitive advantage over its frost sensitive associates which carry an apical growing point at water level and could be killed. In very severe weather where the pond freezes solid then *R. ophioglossifolius* will be killed as the ice reaches its apical bud. In years of autumn drought, plants would be killed by frosts before being covered by water. Holland (1977) noted that plants flower best where the water is 30-45cm deep and it is not necessary for water to subside before growth is stimulated. At Inglestone Common Pond, however, I noted that many plants flourished around the northern edge of the pond where the water level seldom exceeded 20cm.

Life Cycle

R. ophioglossifolius usually germinates in September to October, overwinters and then flowers late May to early June, although it has been known to flower in exceptionally warm weather until November. Sunlight also accelerates the plant's growth (Dring, 1964; Frost, 1971).

Seed Longevity

The seeds of *R. ophioglossifolius* have been shown to persist for 25-30 years in the soil in a state of dormancy where they occur more abundantly in the top 3cm of soil (Toase, 1991-2). At Inglestone Common Pond, Adder's-tongue Spearwort had not been recorded for 40 years but when a trench was dug across the pond in the summer of 1965, they appeared the following autumn and over 100 plants flowered in June 1966.

Distribution and Abundance of *R. ophioglossifolius*

Although Adder's-tongue Spearwort is now restricted to only two sites in the U.K. it is fairly widespread in Europe north to Sweden, in North Africa and across to Western Asia. The French botanist, M. Dominique Villars first described it in his 'Histoire des Plants de Dauphine' in 1789 before it was discovered in Britain (Holland, 1977; Rich, 1993). It is vulnerable or endangered in some areas and protected in France (Briggs, 2005). In the British Isles the species has only ever been recorded in six widely separated localities and is now extinct in four of these.

The first recorded discovery of Adder's-tongue Spearwort was by Charles Babington in St Peter's Marsh, Jersey, in 1838, where it was growing in great profusion. By 1884 it became extinct when the marsh was drained and the area is now pastureland surrounded by small housing estates and factories (Holland, 1977). Seed from this population are now in the Herbarium of the Carlisle City Museum and Art Gallery, Cumbria (Holland, 1977). There are also samples in the Royal Botanic Gardens at Kew from the Badgeworth site and from Inglestone Common Pond donated in September 2007. Other recordings of Adder's-tongue Spearwort in the 19th Century were in East Jersey, Hampshire and Dorset, but land drainage and development destroyed the habitat and these populations.

Adder's-tongue Spearwort was found in Gloucestershire in marshy ground at Cold Pool, Badgeworth, in 1890 by Mr W R Buckell and Mrs Fawkes. It disappeared until 1911 when a small patch grew and in 1912 a large quantity bloomed. Since then it has continue to flourish in fluctuating numbers as a result of climatic conditions and management regimes. Mabey (1996) estimated that 16 million seeds have been produced between 1962 and 1980.

1890	12
1891-1910	None
1911	Some
1912	Many
1913-15	None
1916	Many
1917-23	None
1924	Many
1925-28	None
1929-30	Many
1931	2
1932	1
1933	Many

Table 1 Number of plants recorded at the badgworth reserve 1890-1933

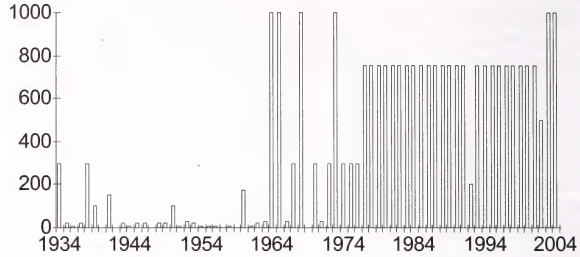

Chart 1 Number of plants recorded at the Badgworth Reserve 1934-2004

R. ophioglossifolius is lovingly known as 'The Badgeworth Buttercup' and a small reserve of 346 sq. yds was established in 1933 to protect it (since enlarged). A Buttercup Queen was crowned every year in the village fête.

Non-botanical books about rare flowers are very scarce indeed, but a novel called 'Midsummer Meadow 1953' by John Moore uses the Adder's-tongue Spearwort to represent something important yet inexpressible in the story. Moore discovered the buttercup in 1939 and bought the meadow to protect it, allowing a travelling Fair to camp there annoying the local council. His story is about the right of the buttercup and the Fair to be there. It unfolds as a morality play with the meadow as its stage. John Moore wrote 'Midsummer Meadow' at a time when rural life was rapidly changing and when many old wet meadows were being under-drained and converted to arable land. There were no powerful lobbies to speak up for rare plants then (Marren, 1999). In 1970 (European Conservation Year) Badgeworth Reserve received an award under the Countryside Awards Scheme in recognition of an outstanding contribution to the countryside for its good management and conservation of Adder's-tongue Spearwort (Holland, 1977).

Inglestone Common pond.

Adder's Tongue Spearwort was not mentioned in White's Flora of Bristol, but Mrs CI Sandwith and her son NY Sandwith spent many years searching for the plant in all likely areas, and described their discovery of a second locality in the Journal of Botany as follows;-

> 'On June 26th 1926 we came across this very rare British species in a new locality in West Gloucestershire. The place may be described as a typical piece of common land and the plant is scattered in a limited quantity around the margins of a fair sized pond, and was also noticed very sparingly in a small drying up depression not far distant. The largest patch is growing in several inches of water quite out of the range of *R. flammula* which is plentiful on the muddy edges of the pond.' (C.I. Sandwith and N.Y. Sandwith, 1926).

It was seen intermittently over the years and a small quantity noted in 1953. The site then became unfavourable due to drainage and lack of grazing. The Pond lies on Lias clay in a similar habitat to Badgeworth with seasonally varying water levels and history of cattle grazing. Gloucestershire Wildlife Trust cleared back the vegetation and created bare ground in the autumn of 1965 and 100 plants flowered in 1966. Since then, plant numbers have been variable but less prolific. Management plans by Plantlife and South Gloucestershire Council aim to restore favourable conditions to the pond. In September 1993 Plantlife dug over the pond and the following summer five plants were recorded. A particularly wet autumn, spring and summer may have prevented germination.

In 1996/97 a temporary fence was erected to exclude cattle from the site. 36 Plants flourished within the fenced area and nine outside! The following year the area was also fenced and in 1998 15 plants were recorded. 1999 was a better year with 48 plants recorded.

From 2000 onwards active management was not carried out and in September 2005 South Gloucestershire Council, in association with Plantlife, mechanically removed decaying vegetation from the pond creating bare earth (BRERC, 2006). In Spring 2006 the pond was filled with water and supported a vast quantity of Water-crowfoots, *Ranunculus sp.*

Only 16 plants of Adder's-tongue Spearwort were recorded in June 2006. The area was unfenced. In 2007 the site was fenced from 5th June to the end of July and 67 plants were recorded. (Inglestone Common: Population of Adder's-tongue Spearwort, adapted from Kitchen, Kitchen and Rich, 1994 and Briggs, 2005)

In November 2007 South Gloucestershire Council mechanically cleared out the vegetation from the western side of the pond. Interestingly, in March 2008 there was no Water Crowfoot growing in this cleared section, or indeed any vegetation.

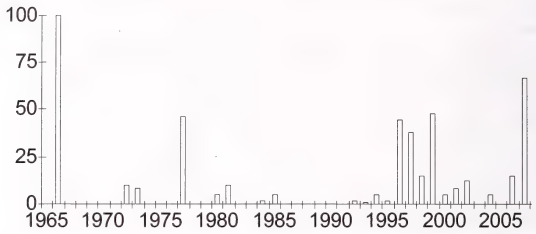

Chart 2 Numbers at Inglestone Common pond, 1966-2007

Rarity

What fascinates me is why Adder's-tongue Spearwort is rare and only found in these two ponds in the U.K. In the Victorian era people became very interested in botany and particularly in searching for rare plants. Rare plants became precious and were treasured for their scarcity and often beauty and vulnerability. So why are some plants rare? Rabinowitz (1981) recognised that there are a number of distinct ecological reasons for rarity and defined different classes of rarity based on three parameters: **Geographical range** - species confined to a small geographical range, but may be numerous where they occur.

Habitat specificity - a species may be geographically widespread but confined to a very specialised habitat.

Population size - where a species occurs, there may always be only a small population.

A species may become rare through changes in any of the above parameters, but the very rarest species are those with a combination of *small geographical range, a high habitat specificity* and *low population size* (Pullin, 2002).

A limited dispersal ability could restrict the range of a species and in that sense would generate rarity: the range of species would be *dispersal limited* (Gaston, 2003). *Ranunculus ophioglossifolius* has no active seed dispersal mechanism and this may be one of the reasons that it is isolated in occurrence in the U.K. Gaston also states that locally rare species with small populations have restricted distribution. The population size at Inglestone Common Pond has never been recorded as greater than 100 plants.

Small populations have a greater risk of extinction due to loss of genetic variability and inability to adapt to changing environmental conditions. They are more vulnerable to natural catastrophes, human disturbance and random genetic loss of favourable genes. Warning signs that populations may be vulnerable include changes in factors such as population size, degree of isolation and fitness. Is this happening at Inglestone Common Pond where other likely habitats have been inspected but no Adder's-tongue Spearwort found?

Retention of genetic variation can also be affected by seed, bulb and tuber banks that buffer populations against dramatic changes in genetic composition (Ellstrand and Ellam, 1993). This could be an advantage for *R. ophioglossifolius* whose seed is able to lie dormant for 25-30 years (Dring, 1964). With the impact of climate change this could benefit *R. ophioglossifolius* dependent on the future weather and whether the plant has the genetic capacity to adapt to it. Dring (1964) found that the genetic composition of *R. ophioglossifolius* in the Badgeworth specimens was different from the Portuguese specimens which was manifest as morphological differences in flower size, leaf shape and fruit characters, perhaps due to geographical isolation and adaptation to different climatic conditions.

Many researchers suggest that species are most abundant at the centre of their range and decline towards their edges. Adder's-tongue Spearwort in Britain is at the northern edge of its range and this may account for its scarcity here. It flourishes in a Mediterranean climate of hot dry summers and mild wet winters.

Abundance and distribution reflect the response of local populations to local conditions thus reflecting the extent to which a local environment meets the multiple niche requirements of each species. For Adder's-tongue Spearwort these appear to be very specific as it occupies a niche between a pond and damp meadow and this probably accounts for its limited distribution in the U.K. Researchers think that Adder's-tongue Spearwort is a native of Britain and may have occurred in the warm period after the last glaciation when the U.K. was joined to Europe. Another theory suggests it could possibly have arrived on the feet of migrant birds (Dring and Frost, 1971).

Data Collation and Direct Observation

I decided to compare management, weather and abundance of *R. ophioglossifolius* at Inglestone Common Pond over the years to explore the factors that lead to increased abundance of Adder's-tongue Spearwort. This with a view to aiding management aimed at preserving the buttercup (Tables 1-4).

		Max T C°	Min T C°	Rain mm	Sun Hrs	Plants
1965	Sep	16.2	8.4	105	112	
1965	Oct	14.4	7	41	85	
1965	Nov	7.9	2.2	75	75	
1966	Apr	10.7	4.3	94	83	
1966	May	16.1	6.9	54	228	
1966	June	20.1	11.2	30	145	100
1966	July	19.9	11	34	145	
1966	Sep	17.5	9.5	162	249	
1966	Oct	13.7	7.4	125	56	
1976	Nov	9.5	3.1	52	63	
1977	Apr	11.7	3.7	33	167	
1977	May	16.1	5.8	42	236	
1977	June	17.3	8.4	100	151	46
1977	July	21.1	11.6	6	200	

Table 1. Weather data. 1965-1977

		Max T C°	Min T C°	Rain mm	Sun Hrs	Plants
1993	Sep	16.9	8.2	106	102	
1993	Oct	12.1	4.5	91	116	
1993	Nov	7.8	2.3	51	43	
1994	Apr	12.7	4.5	31	171	5
1994	May	13.5	7.1	75	142	
1994	June	20.6	10	15	246	
1994	July	24.2	13	25	258	
1994	Sep	16.7	10.2	104	112	
1994	Oct	14.1	6.8	62	109	
1994	Nov	13	8.1	65	35	
1995	Apr	14.5	4.8	26	200	
1995	May	17.4	7	63	232	2
1995	June	20.2	9.9	9	225	
1995	July	24.4	13.3	22	222	
1995	Sep	18.1	9.8	92	135	
1995	Oct	17.1	10.1	61	118	
1995	Nov	11.2	4.2	89	77	
1996	Apr	13.9	4.8	48	139	
1996	May	14.4	5.3	41	183	
1996	June	20.7	9.4	22	269	45
1996	July	23	11.9	15	255	
1996	Sep	18.6	9.5	24	152	
1996	Oct	15.4	8.8	63	100	
1996	Nov	9.6	2.6	67	81	

Table 2 Weather data 1993-1996

		Max T C°	Min T C°	Rain mm	Sun hrs	Plants
1997	Apr	14.7	4.8	26	178	
1997	May	17.1	7	50	241	
1997	June	18.7	10.8	104	122	37
1997	July	22.5	11.9	17	252	
1997	Sep	18.8	10.1	22	146	
1997	Oct	14.4	5.9	57	139	
1997	Nov	11.8	6	96	49	
1998	Apr	11.9	4.5	122	112	
1998	May	19.2	8.7	10	243	
1998	June	18.5	11.3	89	152	15
1998	July	20.3	22.1	16	177	
2005	Sep	20.5	11.4	67	174	
2005	Oct	16.6	10.6	132	82	
2005	Nov	10.1	2.5	68	77	
2006	Apr	14	5.3	18	158	
2006	May	17.6	8.9	109	193	
2006	June	22.6	11.6	17	260	15
2006	July	26.8	14.4	34	310	
2006	Sep	21.5	12.6	58	158	
2006	Oct	16.5	10	83	95	
2006	Nov	12.1	4.4	95	103	
2007	Apr	23.2	-0.5	5		
2007	May	22.7	2.4	142		
2007	June					67

Table 3 Weather Data 1997-2007

Management		
1965	Sep	Trench dug to create bare earth
1976	Nov	Bare earth created
1993	Nov	No fence, heavy poaching
1994	Nov	Poaching
1996	May	Pond fenced
1997	May	Pond fenced, to Aug
2005	Sep	Bare earth created
2006	June	Pond fenced
2007	June	Pond fenced

Table 4. Management, 1965-2007

Results

The factors to come out of this project corresponded well with previous researchers. Bare earth for successful germination in September. January- February frosts killed competitors. Exclusion of cattle from May to end of July, preferably end of August, as in 2007 trampling killed many plants that still had not set seed. High temperatures, light and oxygen necessary for germination provided in April 2007 created conditions suitable for a late Spring germination. The pond drying out also eliminated many competitors. Torrential rain in May filled the pond providing ideal conditions for Adder's-tongue Spearwort to grow.

What is the Future for Adder's-tongue Spearwort ?

As Adder's-tongue Spearwort is a protected species, I think it will survive in its last two strongholds at Badgeworth Reserve and Inglestone Common Pond. Committed management by Gloucestershire Wildlife Trust and enthusiastic volunteers will ensure that the 'Badgeworth Buttercup' remains a treasured viable species. At Inglestone Common Pond, management by South Gloucestershire Council and Plantlife aim to preserve and increase abundance of *R. ophioglossifolius*. Plantlife have asked me to be a Rare Plant Guardian and be involved in the monitoring of Adder's-tongue Spearwort, which I am very pleased to do. The main threats to *R. ophioglossifolius* at Inglestone Common Pond come from loss of habitat due to vegetational encroachment, inadequate management, climate change and changing stock numbers. In 2007 approximately 100 cows grazed the Common. These problems can all be addressed, except climate change, and the variation and abundance of *R. ophioglossifolius* depends as well on the precise conditions it requires for its life cycle. It is impossible to predict whether it will find future conditions favourable to growth.

Plantlife considers that the return of the Adder's-tongue Spearwort indicates the success of the pond restoration project that started in 2005.

Adder's-tongue Spearwort should be conserved, not only for its own intrinsic value, but also as an indicator of the status of ponds and wet meadows. Sixty percent of ponds have been lost over the last 100 years and wet meadows have also been lost and degraded. Let us treasure this 'little buttercup' as a reminder of the fragility and beauty that exists on our earth.

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Ivy

Terry Smith
t.a.smith@blueyonder.co.uk

Ivy (*Hedera helix,* Araliaceae, the ginseng family) is native in the UK and is very widespread in North Somerset, coming second only to nettles in geographical distribution. The name Ivy comes from the Old English 'Ifig' meaning bitter, referring to the taste of the berries. It is highly adaptable, growing on walls, up trees and often as ground cover, frequently in situations of low light intensity and low nutrient status. It may suppress the ground flora, and sometimes good management may indicate that it could be reduced to benefit biodiversity. It is not usually necessary to remove Ivy from trees, unless the growth makes the tree top-heavy and liable to windthrow. The evergreen leaves are unlobed on flowering shoots and typically bear three or five lobes on vegetative shoots. The fertile shoots that are produced in situations of high light intenstiy lack the adhering rootlets and tend to project at right angles to a supporting tree. The leaves are eaten by horses, deer, sheep and cattle.

Despite the perception of the general public, Ivy is not parasitic, and it uses its stem roots merely to adhere to walls and the trunk of trees. The flowers are used as food by the autumn brood of the Holly Blue butterfly. I have watched these butterflies laying eggs on the Ivy in my own garden. Ivy berries also provide food for many birds throughout the winter, when it is an ideal roost for birds and many invertebrates. In the Autumn it produces flowers that are rich in nectar and that attract many insects, particularly hoverflies and wasps. There are now many ornamental varieties, grown decoratively in our gardens where it is also useful for ground cover. The leaves are rich in terpenoids, and are not attractive to slugs. The leaves and fruits contain the saponic glycoside hederagenin which, if ingested, can cause breathing difficulties and coma. The sap can cause dermatitis with blistering and inflammation. This is apparently due to the presence of polyacetylene compounds

There are two native subspecies in the UK - ssp *helix* ans ssp *hibernica* the latter originating in Ireland and found more frequently in the west of North Somerset. They are not easily distinguished . The subspecies *hibernica* has hairs that are pale yellowish brown with some leaves greater than 8cm across and lobed less than half way to the base. The subspecies *helix* has whitish hairs, leaves often less than 8 cm across with lobes more than half way to the base. Ssp. *hibernica* probably arose in Ireland as a tetraploid, with double the normal number of chromosomes. *Orobanche hederae* the Ivy Broomrape, a leafless plant that grows as a parasite of Ivy and which is found in several parts of Nailsea including my own garden, is said to favour the ssp *hibernica.*

If you happen to look up Ivy on the international web, you will find that many of the references give advice on 'how to eliminate English Ivy from your garden'. Ivy was introduced into the United States and now grows particularly well in the East and West coastal states, and it also flourishes in Australia and New Zealand This is rather like the situation with Purple Loosestrife, a very attractive plant seen occasionally in damp situation in the United Kingdom, but which has taken over large areas of wilderness in the USA since there appears to be no natural means of controlling it there. This shows how careful we must be in transferring alien plants to new territories.

Bristol Botany in 2006

Clive Lovatt
cmlovatt@deloitte.com

"Intelligence has reached us" (J. W. White, reporting the death of his predecessor in Bristol Botany, E. H. Swete in 1912; and C. M. Lovatt doing likewise in respect of A. J. Willis in 2006)

Introduction

Hearing the news from afar, I used White's phrase in my obituary notice of Professor Arthur J. Willis in the Society's Bulletin for September 2006. He had authored 39 annual Bristol Botany reports from 1965 to 2003 inclusive, and as I found in January 2007, he had donated his annual files of botanical correspondence to the Society before his death. In a separate paper in these Proceedings, I will write in more detail about his immense and lasting contribution to Bristol Botany.

White's phrase is also relevant to the much increased capacity for information flow afforded by the internet. No longer is it always necessary to physically trawl through libraries and archives and to rely on chance discoveries and connections. Swete's *Flora Bristoliensis* (1854) is now available on-line in Google Books, where it can be searched or downloaded without charge.

I remain only a minority contributor of botanical records to this annual report. Here in Africa, intelligence (in the form of many excellent plant records from my friends on the ground), has indeed reached us. Two were particularly exciting. Richard Bland re-found *Linum bienne*, **Pale Flax**, on Clifton Down, **G**, opposite the Zoo. I am aware of three prior records only, and none for over forty years. In 2005, John Martin found native *Vaccinium myrtillus*, **Bilberry**, on Felton Common, **S**, in a place not reported in White's Flora nor recently (or at all) in the 10 km square. Growing with it, or nearby were: *Carex pilulifera*, **Pill Sedge**; *Galium saxatile*, **Heath Bedstraw**; *Polygala serpyllifolia*, **Heath Milkwort** and *Molinia caerulea*, **Purple Moor-grass**.

The following aliens are not reported in the *Flora of the Bristol Region* and where specified, are new to one or other vice-county: *Selaginella kraussiana*, **Krauss's Clubmoss** (new to v.c.6); *Pteris multifida*, **Spider Brake;** *Berberis darwinii*, **Darwin's Barberry**; *Rubus odoratus*, **Purple-flowered Raspberry;** *Scrophularia vernalis* **Yellow figwort;** *Conyza bilboana*, **Bilbao's Fleabane** (new to v.c.34); *Anthemis austriaca*, **Austrian Chamomile** (new to v.c.34) and *Scilla messeniaca*, **Greek Squill.**

At a finer scale, several records are additional 10 km squares to those recorded (up to 2000) in the BSBI Atlas or Flora of the Bristol Region (in 15 years to 2000): *Ranunculus circinatus* **Fan-leaved Water-crowfoot;** *Rumex crispus ssp. uliginosus*, **Curled Dock**; *Plantago coronopus*, **Buck's-horn Plantain;** *Datura stramonium*, **Thornapple**.

There are a number of reports of the persistence of species at known sites, and in one case of individual trees. The specimens of *Sorbus bristoliensis*, **Bristol Whitebeam**, found by Miss Atwood in 1852 above Nightingale Valley, Leigh Woods, **S,** and by Miss Roper in 1909, too vaguely reported as on a thickly wooded slope of Clifton Down, **G**, still exist, their very shapes and cliff-edge habitats evocative of the conditions experienced during their formative years (LH). *Gagea lutea*, **Yellow Star-of-Bethlehem** is in serious decline at Littleton Wood, Dyrham, **G** (RSC). *Cyperus fuscus*, **Brown Galingale** has re-appeared at Walton Moor, **S**, after a blank 2005 (RSC).

Although several of the finds reported here were made independently by one recorder after another, it should not be assumed that the eyes of Bristol Botanists knowingly scour every last spot for something old, something new. Of the old Bristol Botanists, there is much to learn, despite the two years White and Miss Roper spent researching the subject a century ago. I have been able to write over twenty pages on the botany of Alexander Catcott, a mere footnote in White's fifty page account. Who would have believed that another Bristol Botanist was commemorated by a stained glass window? And I have a tantalising *Euphorbia* from the edge of Leigh Woods and a garden *Sedum* from the interior awaiting their second names.

Bristol Botanists

In March 2006 I commenced a monthly column in the BNS Bulletin on my former and recent researches on Bristol botanists. Much of the information below has already appeared in the more ephemeral Bulletin. The opportunity is taken here to summarise and update some of the reports. Illustrations include photographs of **James W. White** himself (April 2006) and **Miss Martha M. Atwood** and her 1852 collection of the **Bristol Whitebeam**, *Sorbus bristoliensis* (July/August 2006).

Dr John F. Hope-Simpson died in his nineties in early 2007. "H-S", as he was affectionately known at the Botany Department of Bristol University- he never sought or obtained promotion- had been a research student of Sir Arthur Tansley, the father of plant ecology in Britain. In the late 1950's, H-S supervised the postgraduate research of Elizabeth Pring (later Jones) and Cynthia Campbell on seven rare plants of the Avon Gorge and the Mendips, and around the time of his official retirement he oversaw Vic Cowling, my Clifton flatmate, in his research on Ubley Warren. In the late 1980's we went to see the Pring/Campbell transplant sites at Goblin and Burrington Combes and I have photographs of him at the latter

site. He and Willis wrote a paper on the vegetation of Bristol for the British Association meeting there in 1955.

Alexander Catcott (1725-1779), unknown to White, left a manuscript *Catalogue of the more scarce plants growing near Bristol* and several letters touching on botanical matters (BNS Bulletin for November and December 2006 and continuing). Catcott, Vicar of Temple at Bristol, is best known for his geological interests and his *Treatise on the Deluge* (2nd ed 1768). For our purposes he is the earliest Bristol Botanist who has left any substantial record and about whom much is known. In September 2006 at a BNS meeting on Observatory Hill, Clifton, I read from a copy of his Catalogue and we saw some of the plants he knew in the vicinity, including the coincidentally-named **Alexanders** (*Smyrnium olusatrum*).

Another local botanist, **Gustavus A. O. St Brody**, author of the small *Flora of Weston* (1856, see May 2006 and January 2007 Bulletins) may well have been observed teaching his young students by Wilkie Collins, the famous Victorian novelist, a frequent visitor to Weston-super-Mare who, previously un-noted by Collins' scholars, was a subscriber to St Brody's book. In Chapter 8 of *The Moonstone*, first published in 1868, Collins writes the following dismissive words about naturalists into the mouth of Betteredge, the Butler: "*sometimes you see them occupied for hours together in spoiling a pretty flower with pointed instruments, out of a stupid curiosity to know what the flower is made of. Is its colour any prettier, or its scent any sweeter when you do know?"*. As St Brody wrote in his *Flora*, "no species has been described [with 11 named exceptions] which has not been found and minutely examined by myself".

A separate collection at Bristol Museum is mainly composed of St Brody specimens contemporary with his *Flora of Weston* and remains somewhat enigmatic. Only one specimen, *Atropa belladonna*, **Deadly Nightshade**, has dissections preserved on the herbarium sheet. Some 140 are localised in the area, but incorrectly in a few cases at least. St Brody's later Gloucestershire collection (housed at Gloucester Museum) often explicitly includes, as an aid to identification, plants *reported* to occur in the area.

I have speculated that St Brody may have known the rare **Somerset grass** - not until the next century included in the standard British plant identification books- as his Flora mentions the more common *Koeleria* at Weston (Worle) Hill. St Brody's description is suggestive of the rarer plant, but both species occur there. I now find that these descriptions are clearly simple language borrowings from Macgillivray's abridgement (or re-writing) of Withering's *Arrangement of British Plants*, a handy pocket book regularly reissued from 1830 for half a century. St Brody's unlocalised specimen is a giant and I still wonder if it is a hybrid.

Also at Bristol Museum and according to the label on the box transferred from the Bristol Naturalists' Society, are nine unattributed volumes of fungi, with 714 numbered collections, mostly collected in the decade up to 1848. When localised, mainly in the last three volumes, they are from Leigh Woods, Durdham Down, Stapleton, Dursley and a few other places. One specimen was gruesomely "found in an earthen vessel in which a human foetus was macerating for anatomical purposes". There is little doubt that the collector was Dr Henry Oxley Stephens (1816-1881), author of a short account of the mycology of the neighbourhood of Bristol in 1840, and after whom a genus of truffles, *Stephensia*, was named.

Stephens, the discoverer of *Allium sphaerocephalon*, **Round-headed Leek** in the Avon Gorge in 1847, is also remembered by a memorial stained glass window erected by his widow and children in 1886 in the chapel of the Bristol Lunatic Asylum (now Glenside Hospital Museum), where he had been Medical Superintendent from 1861 to 1871. It bears the apt biblical text, "all they that had any sick with divers diseases brought them unto him". Work pressures and ill-health curtailed his botanical researches.

At Leicester Museum in their out-of-town store are three fine volumes of mosses (but no liverworts) assembled by **Miss Atwood** in the 1850's, quarter bound in rose-pink leather. There are 873 numbered specimens, some 200 of her own collection. About 75 are from the Avon Gorge, and those from Leigh Woods were regularly cited (often as first vice-county records) in the late Joan Appleyard's *Bryophyte Flora of North Somerset* (1970). We can see Miss Atwood, a strong confident figure, examining her specimens at the microscope in a photograph dated September 1856 (BNS Bulletin July/August 2006).

During most of the 1840s and 1850's, the Atwood family (a retired farmer, his wife and three maiden daughters in the 1851 Census) lived at 12 Clifton Vale, a substantial terraced house with views of the south end of the Avon Gorge. They seem to have enjoyed sea-side visits. Miss Atwood collected mosses from Aberystwyth in Wales in June 1854 (also flowering plants in H. C. Watson's herbarium at Kew) and from the north and south coasts of Devon in 1853, 1854, and 1856. There are also lichens mentioned in Leighton's *Lichen Flora* from the same places. My reference to an 1838 letter to Watson offering Cardiganshire plants has to be a misreading for 1858, or thereabouts.

I have yet to discover how Miss Atwood emerges into the botanical limelight, fully-formed as it were, and then almost fades away after a decade of activity, though she remained a member of the various national botanical societies from 1852 for at least 20 years. Around 1859, she moved to Bath, probably with her sisters, and then around 1861 they moved to Worcester, where she died in 1880. Interestingly, E. H. Swete, author of the *Flora Bristoliensis* (1854) which Miss Atwood so comprehensively assisted with, was working there as a Public Analyst

during part of this period. T. B. Flower, the other major contributor resided at Bath. Did any of them meet again?

At Bristol Museum are 98 specimens of liverworts and some mosses collected by **Miss Ida M. Roper** (1865-1935) between 1899 and 1934 and initially given to Mrs Bowen. They were collected from the Avon Gorge, Nailsea and Shirehampton. Further information, including a photograph of her drawing of a thalloid liverwort is set out by the Curator, Sam(antha) Trebilcock (now Hallett) in the BNS Bulletin for February 2007.

A note on the Cundall family (father James (1808-1884) and his two daughters) appears in the plant records section under *Ophrys*.

Bristol botany bibliography

The Characeae or Stonewort family, including the genera *Nitella* and *Chara* were formerly included with the flowering plants and ferns in British Floras. They are green algae but are sufficiently large (and when calcified, rigid) to be collected when dredging for submerged water plants. White closes his *Flora of Bristol* with two pages on them, covering six species and three additional varieties. Miss Roper and Mrs Sandwith also had an interest in the group.

In *Watsonia*, the Journal of the Botanical Society of the British Isles, for August 2006, (Vol. 26 Part 2 pages 145-169) R.V. Lansdown, N. F. Stewart, C. Kitchen and M. A . R. Kitchen present a new account, *The Status and Conservation of Stoneworts in West Gloucestershire and North Somerset*, with a comprehensive list of records.

Volume four (the second published) of Peter Sell and Gina Murell's *Flora of Great Britain and Ireland* also reached me in 2006. It mainly covers the composite (daisy) family and has a new and enlarged account of *Hieracium*, the hawkweeds, the distilled intelligence of half a century. It is also notable for a number of new varieties, especially dwarf or prostrate coastal ecotypes. Some should be found in our area.

Oliver Rackham's contribution to the New Naturalist series, *Woodlands*, issued in 2006, contains accounts of several local sites, and much of great interest besides, all written in his erudite and readable style.

In *Nature in Avon* for 2005 Richard Bland, taking a lead from Ron Payne, once of these parts, has written an analytical account of the flora of the walls of Bristol (pages 47-60). He found a total of 206 species (here including some species groups, and excluding grasses), of which 96 occurred in a single 1 km grid square in Clifton. Ivy and Ivy-leaved Toadflax were the most common; colour photographs of four characteristic species are included in the insert.

Richard Bland also wrote a note on Mistletoe hosts (*Nature in Avon* for 2005, pages 61-62). Hybrid Black Poplar, Apple, Common Lime and Hawthorn (in that order) were the most common. He could not find it on six of the 14 hosts mentioned by White, namely Ash, Aspen, Elm, Grey Poplar, Pear and Whitebeam, even though the first three were apparently too common to warrant any localities being mentioned.

Plant records

The area covered by this report remains that defined by White in his Flora of Bristol (1912); in turn this reflected the scope of interest of the Society almost from its inception. White described the area as an irregular right-angled triangle of 720 square miles from Dursley in the north southwards to the east of Bath to Frome, and thence west to the Severn at Huntspill, south of Burnham.

Following White, the portion north of the Avon, falling into the Watsonian vice-county of West Gloucestershire (v.c.34) is designated **G**. The southern portion, **S**, falls within North Somerset (v.c.6). The *Flora of the Bristol Region* (2000) mapped the vascular plants of the former administrative county of Avon and therefore excluded a strip of White's triangle some 13 km south of Brean Down; that area is mapped at a lower scale in the *Atlas Flora of Somerset* (1997).

Grid references for the 1 km squares in which the plant was found are given for the first time in this report. It is not intended that all records new to a 1 km square will be reported here, but the usage is in accordance with the other reports in Nature in Avon. The plant records are more precisely localised- geographically or by habitat- where possible, and where it seems important to do so.

The plant records are arranged into two groups, Natives and Archaeophytes, and Aliens. Archaeophytes are plants that behave as natives but were or seem to have been anciently introduced by man. Aliens (also known as neophytes) are plants found in the wild but which are more recent introductions. Ideally the groups would be distinguished at the local rather than the national level and in a few cases the plant status is a matter of judgement.

The plant names and sequence within both lists follow the second edition of Stace's *New Flora of the British Isles* (1997) are therefore compatible with the *Flora of the Bristol Region*. Accordingly, the Latin names (*in italics*), which necessarily take precedence, despite the standardisation of English names (**in bold type**), can be unambiguously cited without authors' names, except for the occasions when something new is reported. The vice-county catalogues, online at the BSBI website, and the BSBI *New Atlas* of 2002 are also useful for assessing the importance of the plant records.

Names of the principal contributors of the almost 1,800 plant records received are abbreviated as below, listed alphabetically by surname. The full list of submitted records may be obtained from the author or office bearers of the Botanical Section. *FBR* refers to the *Flora of the Bristol Region* and un-attributed comments are those of the author (CML).

RLB	Richard Bland	BL	Brian Lancastle
HC	Helena Crouch	CML	Clive Lovatt
RSC	Robert (Bob) Cropper	JPM	John Martin
PH	Peter Hilton	RGM	Richard Mielcarek
LH	Libby Houston	PM	Pam Millman
NH	Nick Hudson	EN	Edward Niblett
CK & MARK	Clare & Mark Kitchen	MW	Margaret Webster

NATIVES AND ARCHAEOPHYTES

Equisetum telmateia **Great Horsetail** Portbury Wharf, ST4877, **S**, HP. *FBR* has just one site marked in the 10 km square.

Ophioglossum vulgatum **Adder's-tongue** On promontory at Chew Valley Lake, Herons Green, ST5559, **S**, HP. Eight plants noted on parklands area, perhaps corresponding to David Fry's record in the *Flora of Bristol*, fields at Breach Hill, near Chew Stoke.

Polypodium cambricum **Southern Polypody** Cumberland Basin to Ashton Fields, ST5672, **S**, CML. Growing in several places on the concrete footsteps down from the road, presumably derived from the nearby population on St Vincent's Rocks, **G**, and opposite. It also occurs on Steep Holm, although only recorded there in the aggregate in *FBR* (Hb. CML, c.1981).

Dryopteris carthusiana **Narrow Buckler-fern** Lord's Wood Hunstrete, ST6363, **S**, CK & MARK. Confirmed still present in a site recorded in 1984 by Mr M. W. J. Paskin, one of very few sites in the region. J. W. White reported it there is a "boggy bottom" in 1895. There is an undated specimen in T. B. Flower's herbarium at Plymouth Museum from Frenchay Woods, which may correspond with Miss Atwood's record of around 1853 for Glen Frome, **G**, in Swete's *Flora Bristoliensis*. White was unable to re-find it there.

Blechnum spicant **Hard-fern** Avon Valley Woodland Local Nature Reserve, near Hanham Green, ST6371, **G**, NH. Not recorded in this 10 km square in *FBR*, nor known there to White. Also *Quercus cerris*, **Turkey Oak**, an alien, and good natives including: *Sorbus torminalis*, **Wild Service-tree**; *Galeopsis tetrahit*, **Common Hemp-nettle**; *Melampyrum pratense*, **Common Cow-wheat** and *Milium effusum*, **Wood Millet**.

Taxus baccata **Yew** Cowslip Green, west of Wrington, ST4862, **S**, RLB, who comments that there were two trees on a river bank with their roots in the water, an unusual habitat for this tree of old limestone woods and churchyards.

Ceratophyllum demersum **Rigid Hornwort** The Lagoon, Eastwood Farm, ST6371, **S**, NH.

Ceratophyllum submersum **Soft Hornwort** Puxton Moor, ST4162 **S**, JPM. *C. demersum*, **Rigid Hornwort**, was in one ditch. *C. submersum* was in several ditches being the dominant aquatic macrophyte in places, associated with *Spirodella polyrhiza*, **Greater Duckweed** and *Hydrochaeris morsus-ranae*, **Frogbit**.

Helleborus foetidus **Stinking Hellebore** On a road verge at Abbot's Leigh, ST5373, **S**, RLB. Also a good patch on the side of a green lane, Burbarrow Lane Codrington, ST7177, **G**, CK & MARK. The status of this species in the region is difficult to judge.

Helleborus viridis **Green Hellebore** A clump of probably three plants on the western side of the footpath leading from the B3128 to Cadbury Camp Lane, ST4772, **S**. EN notes that the plants were some distance from a garden but he assumes it not to be native here. White has no record for the site, and *FBR* has none in the 10 Km square.

Ranunculus circinatus **Fan-leaved Water-crowfoot** Redding Pits, near Winford, growing in a seasonal pool in old ochre pit area, ST5363 **S**, Margaret Webster. Apparently new to the 10 km square.

Papaver somniferum **Opium Poppy** Ashton Gate, ST5671, **S,** Somerset Rare Plant Group field meeting.

Chelidonium majus **Greater Celandine** Noted in three places, all beside lanes leading to woods, Clapton in Gordano, ST4773 and ST4975, both EN, and Abbot's Leigh ST5374, CML, all **S**.

Fumaria capreolata **White Ramping-fumitory** Wain's Hill, Clevedon, ST3970, **S**, JPM. In flower, several plants on newly made up sea wall.

Urtica urens **Small Nettle** In RLB's garden in Clifton, ST 5673, **G**, and in the public gardens at Tyntesfield, ST5071, **S**, both RLB.

Chenopodium ficifolium **Fig-leaved Goosefoot** On a newly made up sea wall at Clevedon, ST3970, **S**, JPM, and at Ashton Gate, S, ST5671 where seen by members of the Somerset Rare Plant Group. *FBR* has few records close to Bristol. I have a note of it in Leigh Woods, at the Forestry Commission Car Park, ST5574, **S**, in 1980 and A. L. Grenfell saw it on the recently built Devon Wall under St Vincent's Rocks, ST5673, **G**, at about the same time.

Stellaria pallida **Lesser Chickweed** Severn Beach, ST5383, **G**, JPM. A small patch in flower on an old tip, in 2005. Not apparently recently recorded from this 10 km square. Also in disturbed spots on Sand Point, ST3266, **S**, RSC.

Agrostemma githago **Corn Cockle** Portbury Wharf, ST4876 **S**, HP. Ten plants along the bank of a newly cleared ditch, with *Centaurea cyanus*, **Cornflower** and *Chrysanthemum segetum*, Corn Marigold.

Rumex crispus ssp. uliginosus **Curled Dock** Uphill, ST3158, **S**, CML. A single plant seen on the banks of a muddy creek. Also on the banks of the Severn, north of Severn House Farm, near Berkeley, ST6498, **G**. This is a distinct non-weedy estuarine subspecies with all three tubercles developed on the fruit, long-known and persistent under Burwalls Wood, ST5672, **S**. The records appear to be new to the respective 10 km squares.

Armeria maritima **Thrift** Cribb's Causeway, ST5781, **G**, JPM. A clump in flower by the slip road onto the M5. This seems to be the first record away from the natural coastal habitat in the region.

Tilia cordata **Small-leaved Lime** Sodam Mill, near Cromhall, ST6990, **G**, CK & MARK. A single large tree on a Carboniferous limestone cliff edge.

Lavatera arborea **Tree Mallow** Avonmouth, ST5281, **G**, JPM. One plant by new sea wall. Also inland at Brentry, ST5778, **G**, RLB.

Althaea officinalis **Marsh-mallow** Redcliff Bay, ST4375 **S**, HP. Still at the site noted by the Kitchens in 1993, one large flowering plant and several vegetative.

Rorippa nasturtium-aquaticum **Water-cress** Cribbs Causeway, ST5780 **G**, RLB. In new streams and ponds constructed at the Mall shopping centre, with many other pond plants including *Typha angustifolia*, Lesser Bulrush, ST5880, *Butomus umbellatus*, **Flowering-rush** and *Alisma plantago-aquatica*, **Water-plantain** both ST 5780, 5880 and 5881.

Erophila glabrescens **Glabrous Whitlowgrass** Burbarrow lane Codrington, ST7177 **G**, CK & MARK. On the northern approach to bridge over M5 motorway. Also a single plant identified from the base of Crook Peak, ST3955, **S**, RSC.

Vaccinium myrtillus **Bilberry** Felton Common, ST5265 **S**, JPM. A remarkable find, in 2005, as a native in a place not reported in White's *Flora* nor recently (or at all) in the 10 km square. Growing with it, or nearby were: *Carex pilulifera*, **Pill Sedge**; *Galium saxatile*, **Heath Bedstraw**; *Polygala serpyllifolia*, **Heath Milkwort** and *Molinia caerulea*, **Purple Moor-grass**.

Sedum telephium **Orpine** St Vincent's Rocks, Clifton ST5673 **G**, LH. In my paper on E. H. Swete and his *Flora Bristoliensis* published in Nature in Avon for 2003, I asked, "where now is *Sedum telephium*, **Livelong**, on St Vincent's Rocks?". Two patches I knew in the late 1970's did not survive the building of the Gallery and the erection of fences to the south. Libby Houston confirms the species is still there, just north of the Suspension Bridge Buttress.

Sorbus bristoliensis **Bristol Whitebeam** Avon Gorge ST5673 **G**, **S**, LH. Libby Houston has been able to lead me to what are undoubtedly the two historic specimens of this tree. Miss Atwood's original tree of 1852 was for a long time the only one known. Once a cliff-edge bush escaping grazing, the tree overhangs Nightingale Valley midway between Alpenfels and where the surviving ramparts of Burwalls Camp meet the valley. Only in 1909 was the species found on the Clifton side. The published and manuscript site descriptions are again rather vague. The tree, now with one main trunk (White mentions several), is on a small cliff where the millstone grit overlies the

limestone, just above Bridge Valley Road, facing the Leigh Woods quarries. An oak with a similar managed growth form grows just above.

Mespilus germanica **Medlar** Failand House, ST5173 **S**, RLB. Well established on the roadside, outside garden wall.

Onobrychis viciifolia **Sainfoin** Shortwood, ST6776 **G**, Paul Harrington. Large numbers of plants on roadside verge.

Ononis spinosa **Spiny Restharrow** Splott Farm, Peasedown St John, ST7058 **S**, HC. On a west facing bank to the north of the sewage works, in 2005.

Trifolium fragiferum **Strawberry Clover** Winford, ST5365 **S**, MW. On a newly colonised road verge of the B3130, also wild nearby, ST5465.

Euphorbia platyphyllos **Broad-leaved Spurge** Faulkland, ST7255 **S**, RSC. Flowering in some quantity in a bean field.

Euphorbia exigua **Dwarf Spurge** West of Congrove Wood, Bitton, ST7070 **G**, CK & MARK. Locally abundant in a cut wheat-field, also ST7069.

Linum bienne **Pale Flax** Clifton Down, ST5674 **G**, RLB. Opposite the Zoo, in the grass. An excellent re-discovery for it was apparently at recorded exactly there by G. W. Garlick in BB 1952 and Noel Sandwith in 1962, and only once previously on the Downs.

Smyrnium olusatrum **Alexanders** Congresbury, ST4464, **S**, RLB. *FBR* has only one other record in this 10 km square.

Sium latifolium **Great Water-parsnip** Clapton Moor, ST4573, **S**. PM notes that this has been re-introduced at a site known to White but apparently unrecorded since his *Flora* was published in 1912. Seeds from East Anglia were grown by the Avon Wildlife Trust at Bristol Zoo and a group of plants were put in one Rhyne, and single plants in others.

Crithmum maritimum **Rock Samphire** Severn Beach and New Passage, **G**. BL adds two nearby sites to his record from Severn Beach, **G**, in BB 2003 (ST5384). It is also found in ST5383 and ST5486.

Hyosycamus niger **Henbane** Keynsham Community Forest, ST6667 **S**, MW. Many plants by a footpath in a meadow, seeded with 'meadow mix' some time ago.

Menyanthes trifoliata **Bogbean** In the hospital grounds at Frenchay, ST6377 and at Aztec West, ST6082, both **G**, RLB.

Echium vulgare **Viper's-bugloss** Walton Common, ST4273, **S**, EN. Although recorded as present there for some time (and reportedly a biennial) EN knows of only one plant which has a precarious existence near the top of the old quarry. J. W. White reported it on St Vincent's Rocks, **G**, in 1911 and I saw it there on the lower cliffs just north of the Suspension Bridge, ST5673 in 1980 and there is a record for the same square in *FBR*.

Plantago coronopus **Buck's-horn Plantain** Langford, ST4660, **S**, RLB. On the side of the A38, apparently new to the 10 km square.

Kickxia elatine **Sharp-leaved Fluellen** Bitton, ST7069, **G**, CK & MARK. Two plants in a cut wheat field west of Congrove Wood.

Kickxia spuria **Round-leaved Fluellen** Faulkland, ST7255, **S**, RSC. Flowering in good quantity along edge of bean field.

Aster linosyris **Goldilocks Aster** 17-18 stems, one in full bloom and several just opening or in bud at Uphill, and flowering, but several stems withered at Brean Down, both **S**, RSC.

Erigeron acer **Blue Fleabane** Berrow dunes, ST2951 **S**, RSC. A single flowering plant noted, in a tetrad not recorded in the *Atlas Flora of Somerset*.

Potamogeton natans **Broad-leaved Pondweed** In a pond in Lord's Wood, Hunstrete ST6363, **S**, NH.

Eriophorum latifolium **Broad-leaved Cottongrass** Max Bog, ST4057, **S**, RSC. The number of flowering plants varies greatly each year. 25 fruiting heads seen in 2006, the best showing since 2003. The most RSC has noted has been 190 in 1994.

Cyperus fuscus **Brown Galingale** Walton Moor, **S**, RSC. 30 plants of varying sizes, several very large and at their best, in three areas of open peat, along usual rhine. A good showing after a blank 2005, the hot dry summer obviously favoured this rare plant , as the Hampshire plants were also very fine this year.

Carex viridula ssp. brachyrrhyncha **Long-stalked Yellow-sedge** Lord's Wood, Hunstrete, ST6363, **S**, NH. In a wet flush, by path edge near the *Sphagnum*.

Catabrosa aquatica **Whorl-grass** Hawkesbury Upton, ST7887, **G**, JPM. A big patch on a muddy flush. Apparently not recorded in this 10 km square for many years.

Glyceria maxima **Reed Sweet-grass** Paulton Basin, ST6557 **S**, HC.

Gagea lutea **Yellow Star-of-Bethlehem** At Littleton Wood, Dyrham ST7474 **G**, only a single small patch of leaves could be found, a sad decline for a site that could produce over a hundred blooms in the 1970's, RSC.

Convallaria majalis **Lily-of-the-valley** Bishops Hill Wood, Wickwar, ST7387, **G**, JPM. Several large patches noted, in a locality reported in White's *Flora*. I have no subsequent published record to hand. *Paris quadrifolia,* **Herb Paris**, was growing at the same place.

Scilla autumnalis **Autumnal squill** Plants derived from seed collected in the late 1970's at Swete's "sward on top of the Rocks" beside Observatory Hill (where it finally became overgrown around 1983) and on St Vincent's Rocks nearby were planted in the rockery beside the Suspension Bridge, ST5673, **G**, in 2006. In the 1990's, as detailed in one of the Avon Gorge project reports (available in the Society's library) Libby Houston used the same stock, grown on by Mike Ames of Bristol University, to supplement one population and to introduce it in a large grassy slope elsewhere on the cliffs. The site to which Brunel now famously had a turf transplanted in the early 1830's was (from White's notes elsewhere) on the cliffs somewhere between the Bridge and the Observatory. In the bicentennial of Brunel's birth, LH and CML could not re-find it, though it may have survived to the early 1970's.

Narcissus pseudonarcissus ssp. pseudonarcissus **Daffodil** Suspected native occurrences are reported for the northern part of the Bristol region, **G**, by Pauline & Richard Wilson through the Kitchens, at Bloody Acre, Cromhall, ST6991 and Lady's Wood near Horton, ST7385, and at Martin's Wood, Clevedon, behind Clevedon Court, ST4271 **S**, by EN.

Plantanthera chlorantha **Greater Butterfly-orchid** Sandford Wood near Winscombe, ST4259 **S**, HP. Nine plants seen. Also reported by LH on the northern ramparts of Stokeleigh Camp in Leigh Woods, ST5573, **S**, in 2002.

Anacamptis pyramidalis **Pyramidal Orchid** Chittening Warth, ST5383, **G**, BL and JPM, independently.

Dactylorhiza x grandis **A hybrid Marsh-orchid** Easton-in-Gordano, ST5175, **S**, EN, who reports that in earlier years he had seen *D. praetermissa* on the south side of the by-pass, but this year could only recognise its hybrid with *D. fuchsii*, **Common Spotted-orchid.**

Dactylorhiza maculata **Heath Spotted-orchid** Beside Chew Valley Lake, ST 5559 **S**, HP and later RGM. 500 plants noted by HP. RGM has also distinguished **D. x transiens**, the hybrid with *D. fuchsii* there. This hybrid is not mentioned in *FBR*. In White's day, the two species were not distinguished.

Dactylorhiza praetermissa **Southern Marsh-orchid** In small numbers at two places near Chittening Warth, ST5382 and ST5483, **G**, BL; also beside Chew Valley Lake, ST5658, **S**, RGM, who has also identified *D x hallii*, its hybrid with *D. maculata*, on the north side of Blagdon Lake, ST5160 and at Priddy Mineries, ST5450, both **S**. The last may have been a back-cross to *D. praetermissa*.

Himantoglossum hircinum **Lizard Orchid** A432, just north of M4, ST6678, **G**, RGM in 2005. HP noted 10 plants in 2006 (RSC: 11, an increase on 2005). *FBR* included just one site, a few miles away at Westerleigh, **G**. RSC reports 155 flowering spikes on Berrow Dunes, **S**, a site record under his observation. It was the occurrence of this rare and rather ephemeral orchid, unplanted below a tree in the driveway of a house near Cadbury Camp, **S**, that led me to rediscover White's own annotated copy of his *Flora of Bristol*. Alas, the sightings of that book, previously seen by Noel Sandwith, are also rare and ephemeral, though our combined notes and my photographs are an adequate record. I do, however, now have White's clean shelf copy of his earlier *Flora of the Bristol Coal-field.*

Ophrys apifera **Bee Orchid** JPM reports six plants of var. *friburgensis*, a form with duplicated lateral sepals, still at Weston Moor, ST4573, **S**, where first found by HP in 1998. HP has also found it in the Gordano valley, **S**. Var. *apifera*, with a flat triangular irregularly blotched labellum has been seen by RLB by a new pond on the saltmarsh between Avonmouth and Chittening Warth, ST5280, **G**. It has been known for over 200 years in the Avon Gorge and is illustrated in White's *Flora of Bristol* (facing page 563). The artist, Miss Florence Cundall and her sister, Edith M. Cundall, schoolteachers, compiled 16 delightful volumes of paintings of British plants, either for White

or under his supervision. They even include microspecies of brambles, which were reasonably well thought of ("artistic, soft and bright and remarkably true on the whole") by W. M. Rogers, the expert of the day, writing to White in 1909. By about 1928, when Edith died, they were "now" in White's possession. In 1940 they were donated to Bristol University, having been purchased by one of the Wills family. In 1980, at least, they were in a chest- presumably their original home- in the Botany Library. The sisters' copy of Whites *Flora*, given to them "in grateful acknowledgement" is at Bristol Museum and is sparsely annotated. Their father James's (1808-1884) catalogue and herbarium, the latter inspected by White in November 1902, have not survived, save for a few vouchers he took and a few notes in his *Flora* and its supporting manuscript.

ALIENS

Selaginella kraussiana (Kunze) A. Braun **Krauss's Clubmoss** Tyntesfield NT Garden and Orangery area, ST5071, **S**, PM. New to v.c.6. and *FBR*. There are a few records in the *Atlas Flora of Somerset*.

Pteris multifida Poir. **Spider Brake** In *BSBI News* **104**: 42-3 (January 2007) HC (with Fred Rumsey) gleefully describes the finding and collecting of this species, an addition to *FBR*, on a basement wall in Pierrepont Street, Bath, **S**. There is a photograph on page 3 of the colour section insert. This is the species found in 1974 by the late Mike Mullin on a basement wall in Bristol, **G**, and reported as *P. serratula* L. f. The attribution in Stace's *New Flora of the British Isles* (1997) and elsewhere to *P. serratula* Forssk. (now *P. incompleta* Cav.) is incorrect. The authors have traced only two other British records, of which one in Hampshire may be extant.

Azolla filicoides **Water Fern** Portbury Wharf, ST4877, **S**, HP. A large patch noted.

Araucaria araucana **Monkey-puzzle** Tyntesfield, ST5072 **S**, RLB. Regenerating (if not suckers) beneath an old avenue of the trees.

Laurus nobilis **Bay** Sneyd Park Reserve, ST5575, **G**, and two places near Tyntesfield, ST5070 and ST 5170, **S**, RLB. All apparently self-sown.

Nymphaea alba **White Water-lily** Five localities additional to those in *FBR* are reported by RLB. Several of these are recent introductions, in ponds at the golf course at Westbury, ST5677, at Aztec West, ST6082, and Avonmouth, ST5380, all **G**.

Berberis darwinii Hook. **Darwin's Barberry** Pilning, near Severn Beach, in the hedge of abandoned garden, opposite The Plough, ST5684, **G**, JPM. Not included in *FBR*, where it was admitted that alien species of this genus might be under-recorded. Apparently new to the 10 km square.

Mahonia aquifolium **Oregon Grape** Ashton Park, growing in estate wall, ST5571, **S**, and Tyntesfield regenerating in wood, ST5072, **S**, both RLB.

Papaver pseudoorientale **Oriental Poppy** In *FBR*, this is recorded as a rare garden throw-out with just two one km square records. The remark that "attempts have been made to remove this species from the Avon Gorge"

appears to be incorrect, as I have no other record of it there. It is not clear to what species the remark is intended to refer, MARK.

Ficus carica **Fig** By the River Malago, ST5870, **S** and the River Trym, ST5677, **G**, both RLB.

Alnus cordata **Italian Alder** City dock wall, ST5872; also self-sown at Cribbs Causeway Mall, ST5780, both **G**, RLB.

Persicaria capitata **Pink-headed Knotweed** Codrington, ST7278, **G**, CK & MARK. Several plants at the base of a wall at the Codrington Arms, presumably derived from flower baskets. Not in *FBR* but recorded in BB2001 by a pub wall, **S**.

Fallopia x bohemica **a hybrid Knotweed** By the sewage treatment works, Avonmouth, ST5379 **G**, JPM.

Alcea rosea **Hollyhock** Long Ashton, ST5369, **S**, RLB, growing on a roadside. For some years around 1980 it grew unattended at the entrance to the Observatory, Clifton, ST5673, **G,** CML.

Aubretia deltoidea **Aubretia** On a wall by the River Trym ST5777, **G**, RLB. *FBR* has only a few records, normally on garden walls. In 1978 I saw it at St Vincent's Rocks, Clifton, on the vertical buttress below the Bridge, ST5673, **G**, and in 1980 it was surviving in garden rubbish thrown into Leigh Woods, also ST5673, **S**.

Crassula helmsii **New Zealand Pigmyweed** Longbarrow Square, Stony Littleton, ST7357 **S**, through HC. On the edge of small pond created and planted a few years ago.

Spiraea salicifolia **Bridewort** Frenchay, ST6378 **G**, RLB. By a roadside. *FBR* has just four records for Brideworts.

Rubus odoratus L. **Purple-flowered Raspberry** Avon bank, near Temple Meads, ST5972, **G**, RLB. New to *FBR*, a rare alien, easily distinguished by its simple leaves and large purple flowers.

Potentilla recta **Sulphur Cinquefoil** Hencliff Wood, ST6731 **G**, RLB. The plant persists at the site recorded by R. D. Randall in 1987 and reported in *FBR*, as one of just four localities.

Duchesnea indica **Yellow-flowered Strawberry** Brandon Hill, ST5872, **G**, CK & MARK. A small patch on a south-east facing grassy slope partly shaded by trees. Five sites are mentioned in *FBR*. It has persisted for over 25 years in Nightingale Valley, Leigh Woods beside the Plain, ST5573, **S**, CML.

Alchemilla mollis **a garden Lady's Mantle** On the disused railway, Ashton Gate, ST5657, **S**, Somerset Rare Plants Group.

Rosa rugosa **Japanese Rose** Bristol Docks, ST5772, **G**, RLB. Self-sown on the rail track. There are few records in *FBR*. Scrambling plants on either side of the Avon Gorge in the late 1970's were inexplicably short-lived (Observatory Hill, ST5673, **G**, and under Burwalls Wood, ST5672, **S**), CML.

Prunus padus **Bird Cherry** Lower Woods, Wickwar, ST7488, **G**, JPM.

Cotoneaster sternianus **Stern's Cotoneaster** Troopers Hill, ST6373, **G**, CK & MARK. Growing nearby was *Cotoneaster* cf. *rehderi*, **Bullate Cotoneaster**, both det. J. Fryer.

Pyracantha coccinea **Firethorn** Avonmouth, ST5278, **G**, and on the old railway at Ashton Gate, ST5671, **S**, RLB. There are only three records from the 1990's in *FBR*, but it occurred on both sides of the Avon Gorge in the previous decades.

Melilotus albus **White Melilot** Near Hawkesbury Upton, ST7785, **G**, RLB, who remarks that the field was so full of this and *Melilotus altissimus*, **Tall Melilot** as to suggest possible sowing. In quantity on a waste tip, Long Ashton, ST5569, **S**, also RLB.

Myriophyllum aquaticum **Parrot's-feather** In a pond in Mill Road, Radstock, ST6954, **S**, HC.

Fuchsia magellanica **Fuchsia** Self sown at a roadside, Failand, ST5171, **S**, RLB.

Euphorbia characias **Mediterranean Spurge** Waste ground, Avonmouth Docks, ST5180, **G**, RLB.

Vitis vinifera **Grape-vine** In a gutter, Bradley Stoke, ST6180, **G**, RLB and at a roadside in Winterbourne, ST6479, **G**.

Parthenocissus quinquefolia **Virginia-creeper** West Tanpit Wood, ST5273, **S**, RLB. There are few records for Virginia-creepers in *FBR*. I find young *P. quinquefolia* and *P. inserta* hard to distinguish. One or both have occurred above (recently) and below (late 1970's to 1980's) Burwalls Wood, ST5672, **S**.

Rhus typhina **Stag's-horn Sumach** This species has 12 locations in *FBR*. RLB adds four: Knowle, ST5970, and Ashton Vale, ST5670, both **S**, and the Avon at Crew's Hole, ST6273, and Winterbourne, ST6579, both **G**.

Geranium endressii **French Crane's- bill** Ferney Row, Failand, ST5272 **S**, RLB. *FBR* has only three records, all from the 1980's.

Tropaeolum majus **Nasturtium** Uphill, ST3158, **S**, CML. A few leaves in the grass near the roadside under a field wall below the old church on the hill.

Impatiens capensis **Orange Balsam** Bristol Docks, ST5972, **G**, RLB.

Physalis peruviana **Cape-gooseberry** In a roadside gutter, Bradley Stoke, ST6180, **G**, RLB.

Datura stramonium **Thornapple** Chittening Warth, ST5382, **G**, BL. Over twenty plants on disturbed ground, all rather small. Also a single plant at Redwick, ST5585, **G**, JPM. Apparently new to the 10 km square.

Nymphoides peltata **Fringed Water-lily** The Lagoon, Eastwood Farm, ST6371, **S**, NH.

Phacelia tanacetifolia **Phacelia** Horton Court, ST7785, **G**, RLB. Trackside in a field, possibly sown as pheasant food. *FBR* had two records as unplanted casuals.

Symphytum asperum **Rough Comfrey** In the National Trust garden and orangery area, Tyntesfield, ST5071, **S**, PM. *FBR* has no record for the southern part of the area and there is only one v.c.6 record in the *Atlas Flora of Somerset*.

Symphytum orientale **White Comfrey** Three new 1 km square records are provided by RLB, Avonmouth Docks, ST5180 and Lockleaze, ST6076, both **G**, and Portbury, ST4975, **S**.

Verbascum blattaria **Moth Mullein** A few plants on the old railway near the Industrial Museum, Bristol Docks, ST5872, **G**, RLB and JPM, independently.

Verbascum virgatum **Twiggy Mullein** Three flowering plants and several rosettes in a field, Walton Moor, ST4372, **S**, RSC. Seen there by him in 1993 and still extant.

Scrophularia vernalis L. **Yellow figwort** Bradley, Wotton-under-Edge, ST7493, **G,** CK & MARK. A single flowering plant in wall near the Pump House. Not mentioned in *FBR*, though there is a record for Cranbrook Road, Bristol in BB1929.

Linaria x dominii **Hybrid of purple and pale toadflaxes** Avonmouth, ST5379 and ST 5279, **G**, RLB and JPM respectively. Though infrequently reported, the hybrid has long been known at Avonmouth.

Pilosella aurantiaca **Fox-and-cubs** Avonmouth, ST5178, **G**, and Brislington Brook, ST6271, **S**, RLB. I have not seen it for many years in Quarry 2 under Leigh Woods, ST5574, **S** where reported in BB1980, though it was well-established at the time.

Erigeron karvinskianus **Mexican Fleabane** Although shown as a uncommon introduction in *FBR*, RLB reports another 27 grid squares in ST 56, ST57, ST67 and ST68, **G** and **S**.

Conyza sumatrensis **Guernsey Fleabane** Along the old railway track and by the new sea wall, Chittening Warth, ST 5280, **G**, JPM.

Conyza bilboana J. Remy **Bilbao's Fleabane** Many plants on a railway track on the north side of River Avon cutting south of the Floating Harbour, Bristol, ST5772, **G**, PH. New to v.c.34 and *FBR*

Anthemis austriaca Jacq. **Austrian Chamomile** Bristol, ST5872, **G**, JPM. New to v.c.34 and *FBR*. On a small traffic island (Prince Street/ Queen Street) with *Chrysanthemum segetum*, **Corn Marigold**, and one plant of *Centaurea cyanus,* **Cornflower** suggesting wild flower mix, and *Echinochloa crus-galli*, **Cockspur**.

Xanthium strumarium **Rough Cocklebur** Clifton, ST5673, **G**, RLB. An accidental bird seed alien, in the recorder's garden. There is only a single record in *FBR*.

Stratiotes aloides **Water-soldier** Abbot's Pool, Abbot's Leigh, ST5373, **S** RLB. *FBR* had one extant record. With *Nymphaea alba*, **White Water-lily**, *Nuphar lutea*, **Yellow Water-lily**, *Ceratophyllum demersum*, **Rigid Hornwort**.

Lemna minuta **Least Duckweed** Puxton Moor, ST4162, **S**, JPM, abundant in most of the ditches.

Briza maxima **Greater Quaking-grass** Easton, ST6174, **G**, RLB. *FBR* has just three recent records.

Bromopsis inermis **Hungarian Brome** New Glebe Farm, Didmarton, near Oldbury on the Hill, ST8288, **G**, CK & MARK. A patch 2m x 1m on road verge. *FBR* has only three records, all from the 1980's.

Echinochloa crus-galli **Cockspur** A single plant at the lay-by on the Portway (A4) by the Great Quarry, ST5674, **G**, PH. Also several seen by CML under a south-facing wall in Hotwells, ST5772 , **G**, with *Digitaria sanguinalis*, **Hairy Finger-grass**, and as noted above, on a traffic island in ST5872.

Setaria pumila **Yellow Bristle-grass** Between two graves in Greenbank Cemetery, Eastville, Bristol, ST6174, **G**, Phil Quinn, through the Kitchens. Also abundant on the old railway near the Industrial Museum, Bristol, ST5872, **G**, JPM.

Fritillaria meleagris **Snakes-head Fritillary** A single white flowered plant on the River Frome Walkway, Frenchay, ST6478, **G**, Paul Harington.

Scilla messeniaca Boiss. **Greek Squill** Smallcombe Wood, ST7664, **S**, JPM. 170 flowering spikes along the edge of the wood and along an adjacent hedge. This is a rare alien in Britain (five 10 km squares in the 2002 *Atlas*) and it is not mentioned in *FBR*, either as recent or otherwise.

Allium triquetrum **Three-cornered Garlic** Four further records for this increasing introduction, in ST5486, JPM; ST5779 and ST5869, RLB (all **G**); ST4773, **S**, EN.

Allium paradoxum **Few-flowered Garlic** Almondsbury Hill, ST6084, **G**, CK & MARK. 24m strip in flower on the west side road verge of the A38. The finders point out that the only other Bristol region v.c.34 record is at Bitton in 1964.

Leucojum aestivum ssp. pulchellum **Summer Snowflake** Almondsbury Hill, ST6084, **G**, CK & MARK. The finders point out that this is the first record for the northern half of the Bristol region, and the second for v.c.34.

Galanthus plicatus **Pleated Snowdrop** Elberton, ST6088 **G**, JPM, who adds that these plants were difficult to determine to subspecies using the book characters.

Iris germanica **Bearded Iris** Avonmouth, by Sewage treatment works, ST5379, **G**. A fine stand of an attractive form by roadside ditch seen by RLB and later JPM.

Acknowledgements

I would again like to thank all contributors for their interesting plant records, even if some allowed their spreadsheets to become infected by other organisms, and out of range records; something hardly possible in the old days of letter writing. I thank the Editor and Society for their indulgence of the delays in submission in a year in which my personal circumstances changed rather dramatically and found me, not in Bristol, but in Nairobi again. And as ever, the continuity of Bristol Botany owes so much to those that have gone this way before. With apologies to the ladies again, as Wordsworth wrote, I could not print/ ground where the grass had yielded to the steps/ of generations of illustrious men/ unmoved. And I was moved reading our own Libby Houston's words whilst flying southwards to Africa a day after we last met, passing the site of the Poet's Tree on Observatory Hill at Clifton: Spear-maker, Ash-tree, *safely cross the raging sea.*

A fitting tribute: the late years and funeral of J. W. White (1846-1932)

In this article, Clive Lovatt recounts the late years of J. W White, drawing once again on the H. S. Thompson collection of botanical letters in the Special Collections of the Bristol University Library. The account is concluded with extracts of the newspaper report of White's funeral, which has just come to light.

J. W. White's late years- from letters to H. S. Thompson

H. Stuart Thompson, author of three books on European plants, and a long time resident of Clifton, retained part of his lifelong collection of letters from fellow botanists. They are a particularly rich archive for the history of the Botany of Bristol, stretching from 1889 to 1940. Indeed, the very first is from J. W. White, "I must congratulate you on the keen and accurate observations you have made on the plants of North Somerset". We therefore have letters from White spread over 40 years- and Thompson's fine photograph of him in 1916. Here, I quote from White's late years' when his powers were fading. Bristol Botany in 1929, for instance, seems to have only one of White's own field records, from the Green Valley, below Clifton Downs. No account of Bristol Botany was published for 1931, or again until 1935 when Mrs Sandwith took over.

In July 1925, when he was approaching his eighties, White complained to Thompson that over the last three months he had suffered from a series of ailments that weakened him. He went on to describe staying in Minehead, taking motor rides about Exmoor, and with a son, measuring the girth of a giant walnut tree. With increasingly shaky handwriting in January 1927 he mentioned that "my failing sight does not permit me to work with magnifiers", adding in that almost inevitable epitaph on the seventh age of man, "so many grandchildren are now adult".

In January 1929, White wrote, "Our friend Salmon's sudden death is the heartiest blow I have suffered I believe, since dear Bucknall died [1922], quite as suddenly. When he made that short visit here a few weeks ago…slipped up backwards on our icy path…it was the shock, I suppose that brought on another attack of sciatic and other nerve pains." [I am not sure whose fall and ailments are referred to.] C. E. Salmon's posthumous Flora of Surrey was published in 1930.

All four botanists just mentioned were frequent visitors to the Continent for collecting plants. There are accounts of some of White's trips in the Pharmaceutical Society year books; Thompson described them as "racy"- as full of anecdotes as these essays. In July 1903 Salmon had written to Thompson that he was about to join White in a visit to the Pyrenees, "I have never met him but, by his letters, he must be a most interesting & delightful man to go with…he thinks … Cedric Bucknall will come too". After their tour, White reminisced how Thompson was remembered in the hotels he had recommended, so that the "scattering of

drying papers on the floor was considered merely English madness", as was Salmon's "yearning for daybreak tea". Bucknall's many talents included languages- he was by profession an organist and choir master in Clifton- and he and White were almost constant botanical companions.

In April 1930, Thompson was elected an Associate of the Linnean Society, on the application of White, and of A. G. Tansley, the father of plant ecology in Britain. Tansley had contributed an illustrated introduction to the vegetation of the Riviera in Thompson's 1914 book on its flowering plants- and in the meantime been analysed by Freud!

In May 1930, Mrs Sandwith noted that there was to be a meeting of "the old Botanical Club" the following evening and hoped Thompson would come. The club ran for about 30 years and did not survive much longer. The Bristol Naturalists' Society reportedly has its minutes. Thompson had been the secretary of a similar club at Cambridge University back in 1891. "There are now few members to attend & I think Mr White enjoys the little meetings…It keeps him in touch with what is going on in the district botanically. It is rather tragic to think that he is unable to take his part in outside activities." The club met at White's house, Warnham, 18 Woodland Road; it later became part of the Hawthorns Hotel and in the 1990's was acquired by the University. The staff dining room there was apparently named after White.

In a review of Bucknall's account of *Symphytum* the Comfreys, H. W. Pugsley, a botanical visitor to Bristol since at least the 1890's and later author of a weighty monograph on *British Hieracia*, the hawkweeds, wrote that the account was "really very superficial" and "I have let down Bucknall as lightly as possible & hope that Mr White will not feel any possible reflection on his old friend."

On 31 July, probably in 1931, White wrote, "I cannot write very much…I am so glad to hear of the survival of *Veronica hybrida* [Spiked speedwell]. Early in the year I asked my car driver to go on the rocks below the Great Quarry & he reported plenty of *Arabis stricta* [Bristol rock-cress] which I had shown him at Penpole Point. Evidently the Portway is doing good by protecting some of our rarities." 1931 was the 60th anniversary of his marriage as was reported in the local press; he had earlier honoured his wife's family name, Naldrett, in a species of bramble.

In May 1932, White again apologised for his handwriting - he was latterly using a pencil rather than pen and inkwell-and remarked on the recent obituaries of Druce and Mrs Gregory. "What a remarkable man he is", White had written of Druce in 1924. He had single-handedly controlled the forerunner of today's Botanical Society of the British Isles for many years. Druce, a pharmacist like White (and a far more substantial officer in the Pharmaceutical Society), had some connection with a convalescent home in Bristol, and apparently visited annually on Boxing Day. "He regaled us for more than an hour with his resume of his intimacies with

lords and ladies during the past season, including the King's entourage at Balmoral". Mrs Gregory was resident at Weston-super-Mare for many years, and wrote a monograph on British Violets (1912). Tony Titchen has her annotated copy of White's Flora.

In June 1932, A. J Wilmott came to Bristol to study and collect whitebeams. He was still referring to the Bristol Whitebeam as "*decipiens*" in September 1932 and it was after White's death, in 1934, that he described it as a new species, *Sorbus bristoliensis*. "I was glad to see Mr White", he wrote. We can only assume that they may have discussed the botanical history of the tree which I have recently begun to reconstruct- did Wilmott mention what he made of its distinctiveness and that he hoped to name it?

On 4 July 1932, White thanked Thompson, "you are remarkably good to me…I can hardly say which gave me the most pleasure- the long lost sedge or the beautiful fish". I have not identified the sedge, but Thompson was a keen fly fisherman and White much enjoyed the trout he received. White died on 26 October 1932 and this was his last letter to Thompson, unless any were destroyed.

The only explicit mention of the death of White in Thompson's collection of letters is from Pugsley, "I was sorry to hear of the recent death of Mr White, altho' of course it was not unexpected. I think he was a good botanist & a very worthy man, and that his flora is the most interesting & perhaps the best of all British local floras." It is still generally held in this high regard

.

Surprisingly, given their extended correspondence, shared interests and his residence in Clifton, where the funeral was held at the parish church, Thompson was not mentioned as present. He seems to have been a retiring and sensitive man, prone to concerns about his own health and perhaps it would have been too much for him. White had in 1928 described him as "the most helpful person within the range of my botanical knowledge", just one of many well-worded compliments to his fellow worker in the field.

It was Thompson who rescued a certain notebook, probably White's landscape interleaved *Flora of the Bristol Coalfield* entitled "notes for a new edition". Noel Sandwith wrote in February 1933, "to burn it would have been extraordinarily foolish; such manuscripts so often hide details of information. Could you not bequeath it, perhaps to the University, to be kept with the other archives relating to the Bristol Flora and Mr White's herbarium?" This appears to be what happened, although this disposition is not amongst those apparent from Thompson's letters, photographic diaries and book indexes.

J. W White's funeral

The funeral notice of J. W. White, from a Bristol newspaper begins as follows.

"DRAPED WITH AUTUMN LEAVES. Funeral of Well-known Bristol Botanist

A fitting tribute to the late Mr James Walter White M.Sc., F.L.S., a noted botanist and late lecturer in botany at Bristol University, was the draping of his coffin at the funeral, on Saturday, with a pall of leaves of autumn tints.
Amongst the naturalists present were: T. G. Green, representing the Wild Flower Society; Macgregor Skene Professor of Botany at Bristol University (White's honorary M.Sc. was from Bristol and is the source of the photograph of him as a smiling white-bearded man in robes); Mrs Sandwith (also representing her son Noel, of Kew) and Miss I. M Roper, representing the Bristol Naturalists' Society. Bristol Museum (which of course now has his herbarium) was represented by a Deputy Director, Dr F. S. Wallace. H. J. Gibbons, another attendee, was described in his own obituary notice by Mrs Sandwith (Bristol Botany in 1939) as "one of the most active members of the former University of Bristol Botanical Club". A Miss Bucknell [*sic*] was presumably an unmarried daughter of White's great friend Cedric Bucknall who, as mentioned above, had died in 1922.
It is more than likely that White's friends collected the autumn leaves from the Downs or if they had that particular sense of place, Leigh Woods. As he had written of that famed place of uncommon interest (pages 13-14 of his *Flora*): "They contain nearly every indigenous tree in the country, and offer in consequence a foliage of singularly varied tint, from that of the darkest Yew to the pale light green of Lime and Oak, or silver of the whitebeam. The larger trees grow here on such an insufficient subsoil that they sometimes put on hues of autumn before summer is half over."

A fitting tribute indeed! The funeral was held at Clifton parish church and, as is now well known, White is buried at Canford Cemetery.

Acknowledgements
To my father, now 87, who on my behalf accepted my research studentship at Bristol University whilst I was out of touch in the flower meadows of the Pyrenees, and to the late Dr Lewis Frost, who, in his own way, let me get on with my historical researches even though some were regarded as peripheral. Particular thanks are due to the librarians at the Special Collections archive in the main University library for their care of Thompson's letters and for making them available to me during a most interesting week almost 30 years ago.

White and White's Whitebeam

Members of the Bristol Naturalists Society who attended the February meeting of the Botanical section, and members of the Botanical Society of the British Isles will have heard that a new Whitebeam species has been added to the Bristol flora. *Sorbus whiteana* T. C. G. Rich & L. Houston is described and typical leaves are illustrated in the February 2006 part of the BSBI Journal, Watsonia (Vol. 26 pages 1-7).

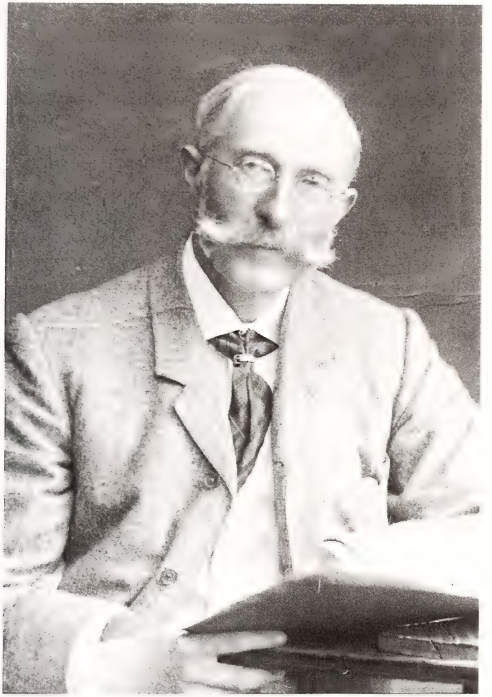
This is the species formerly confused with *Sorbus wilmottiana* below the Great Quarry in the Avon Gorge, and it is also known in the Gully and the slopes between these sites, and also in three places on the slopes below Leigh Woods. Remarkably, Libby Houston has also identified it in the Wye Valley.

The authors have named the new species (both in Latin and English), after J. W. White, author of the Bristol Flora, 1912, and a President of the BNS from 1907 to 1909. White collected the species in 1920 and this is the first collection so far recognised (Kew Herbarium; none at Bristol).

It is surely a rare occurrence for a member of our Society (as Libby Houston is) to take part in naming a species after another member of the Society. White himself of course named a bramble, *Rubus bucknallii* J. W. White after the finder, his close friend and fellow BNS member Cedric Bucknall.

As there seems to be only one published portrait of White (as an old man in his obituary in the Society's Proceedings), the appended portrait (from the collection at Kew) should be of interest. I also have a copy of a full-length photograph taken by H. Stuart Thompson in 1916, which shows White as a "portly gent" (original negative in the Special Collections, Bristol University Library).

White was a pharmacist and worked in Clifton, at what is now an upmarket retailer of ladies' gowns on the corner of Royal York Crescent. His firm's name Giles Schact & Co was still visible there in 2004. Imagine him walking to work from his home in Woodland Road near the University. To round off the story, it is probably the same Giles who, as the "Clifton Student", appears in White's Flora as one of the privileged few Victorians who found the semi-pinnate *Sorbus* hybrid, *x thuringiaca* in Leigh Woods.



The botanical MSS & other memorials of James Walter White (1846-1932)

James Walter White's *Flora of Bristol* (1912) is widely regarded as probably the finest expression of that particular type of local flora of encyclopaedic proportions that covers both recent and all earlier records, and details the supposedly peripheral matter of the lives and contributions of those botanists who "have gone before". "We must clear away the moss that may have grown upon the tombstones of our predecessors, and chisel out afresh the half-effaced inscriptions", he wrote.

White's 57 page "History of Bristol Botany" was a two-year task of the later part of the first decade of the 20th Century, assisted by Miss Ida Roper. Though "tedious", he declared it was "to some minds …not less attractive, nor less interesting than other portions of the task set to the author of a local Flora". By "tedious" he meant time-consuming and uncertain as to its rewards, for he had earlier written of the "charm of research" and the impossibility of any last word in field botany.

As White continued, in any case, the researcher would inevitably come almost face to face with his forerunners and therefore would regard them with increased respect, understanding how they "produced work so original, exhaustive, and enduring", despite "the real hindrances and difficulties in that far-off age". The words are apposite: two days ago, without leaving my office desk in Malawi, I found on the internet a photo of White's own forerunner, E. H. Swete. Like White, he appears as a portly and whiskery gent, topped with a straw boater in a garden setting.

Other than several obituaries, there is no other account of White's own life and botanical contributions than the two-page account in the 1948 Flora of Gloucestershire, which was probably drafted by his friend H. Stuart Thompson (1870-1940). With good fortune, these monthly notes may come together into a supplement to White's own historical account. Here, I will briefly describe those of White's unpublished manuscripts of which I am aware, and indicate some other details of his life and times. Unless otherwise stated, all sources are accessible at Bristol University.

Far from coming to Bristol as a tyro (a novice) as he claimed, White was already well grounded in botany. His herbarium retains a huge cowslip with two detached leaves from his original silver medal prize-winning collection of 423 Weymouth specimens "as an example of how not to do it". William Bowles Barrett (1833-1915) appears to have been his mentor there. White's copy of the 1860 (last) edition of William Hooker's British Flora (Hooker and Arnott) was presumably the book he used to learn his plants from. It has annotations, including one of *Allium sphaerocephalon* on St Vincent's Rocks.

White's copy of Swete's *Flora Bristoliensis* (1854) is also annotated and, there is a letter bound in from that most eccentric botanical gossip Thomas Bruges Flower (1817-1899), a contributor, stating that he wished the book had never been published.

White had of course been invited by the Society to prepare this Bristol flora after the failure of an earlier initiative in 1868 to map the plants in a 9-mile radius of Bristol by square miles. In the end, the title of Editor was clearly little more than a courtesy. As White describes, Flower was helpful to him, clearly because he approached him in the right way, and in the notebooks White used to record localities for the Flora of the Bristol Coal-field, there are many letters from Flower, dealing with old or current records of those plants due to appear in the next published instalment (our Proceedings for 1881-1886). "Don't repeat it but do be cautious about T. B. Flower's statements", wrote Reverend R. P. Murray in 1886. White also annotated his copy of Murray's Flora of Somerset (1896).

Four of the five foolscap notebooks are extant (missing part of the monocots), entitled *Flora Bristoliensis...Auct. Soc. Nat. Brist.* *Allium sphaerocephalon*, for example, has seven separate manuscript notes and comparison to the published account only proves how complementary the two sources are. White had a fresh memory, a need for concise summarisation and other sources to hand. He mentions Sowerby's English Botany (third edition); his set seems to have passed to Noel Sandwith and through Arthur Willis to Lewis Frost and may now be at the latter's Cambridge College.

White next used for his species notes a landscape format interleaved copy of his flora, entitled *Flora of the Bristol coal-field. Notes for a new Edn.* This too is packed with source material and correspondence. White also kept a scrapbook of *Botanical Memoranda*, short published accounts of the local plants by himself and others such as the obnoxious "Wayfarer", many of which came to be cited in the *Flora of Bristol*.

There is almost no trace of any draft accounts for either of his two floras, whether of the species or the introductory material, though letters to Thompson (Special Collections, Bristol University Library) do indicate the pace of the writing. However the earlier manuscript source has a near final account for *Scilla autumnalis,* adding in respect of the two additional sites described at St Vincent's Rocks, that they were a considerable distance from the two mentioned and that "wild horses would not etc. etc." So it proved that nothing would make him reveal the localities, for there is no note elsewhere either.

White resolved to Thompson "never to write another once this Flora is off my hands". He did publish in 1918 a Supplement in the Journal of Botany, but in truth it is no more than a compilation of the annual Bristol Botany report for the intervening period. White also interleaved his Flora of Bristol and I was privileged to see it in 1980. It seems to have remained at a cabin in a woodland retreat White had near Cadbury Camp and been incorporated into the library of a writer on Rock Garden plants. It may be difficult to trace, but Noel Sandwith had seen it and made 11 small pages of brief notes and I took some photos and transcribed full accounts related to the Avon Gorge and for some species of interest (eight A4 pages). There are maps of *Antennaria dioica*, Mountain Everlasting, at Failand ("18 yards from a holly tree…10 feet beyond a little furze bush") and *Cladium mariscus*, Great Fen-sedge at Shapwick. The story of the "Meeting on the Bridge" in the June 2006 Bulletin is almost wholly based on notes from this source.

Around 1930, White apologised to Thompson for his poor writing in pencil and remarked that he had to send his driver to check on the persistence of the Bristol rock-cress in the Avon Gorge. White is buried at Canford Cemetery. The story of the discovery in August 1996 of *Sorbus domestica* near Shirehampton on a celebratory field meeting of the 150th anniversary of his birth is described in Bristol Botany for that year and illustrated with a photograph in the *Flora of the Bristol Region*.

There are many other letters from White or mutual friends amongst Thompson's botanical correspondence. Thompson introduced White to Charles Salmon (d 1930) of Surrey who joined White and Cedric Bucknall on their so far uncharted botanical excursions to Europe. Thompson, the author of three books on European plants, surmised they had recently stayed at a certain hotel, for the *patron* recalled the eccentric Englishmen who demanded tea with milk and dried plants in their rooms. Thompson wryly suggested they were perhaps the cause of the bristly *Cynoglossum* seeds in the towels.

Noel Sandwith praised Thomson for rescuing certain unspecified books for posterity. His herbarium was bequeathed to Bristol University where it joined those of two of his co-workers, Bucknall and Fry. At one time it was in some 30 cabinets, though he periodically thinned it out. Thompson (generous himself but often short of ready cash) surreptitiously sold some of White's specimens to the National Museums of Wales. One of them had commented, "I should prefer their space to their company". It was their quality that made them marketable; for White was a member and sometimes Distributor of both of the Exchange Clubs, predecessors to the current Botanical Society of the British Isles. My own herbarium label is copied from White's and is housed in what later turned out to be one of his cabinets.

White's two lives are almost separate. We can still faintly see the name of his pharmacy in Clifton and some of his botanical notes and letters are on business letterhead. I did not locate his home address, Warnham, on Woodland Road, Clifton. He thanked his wife for her "toleration and sympathy" whilst engaged on his Flora, and named a Sussex bramble, *Rubus naldrettii*, after her maiden name. A probable grandson, Bob White, fell onto hard times after the Second World War, sold off the 17 and a half acres of woodland retreat and was last heard of as a family man running a garage near Guildford. It may not be easy to trace relatives today.

For anyone wanting to possess their own memorials of J. W. White, there is a subscriber (T. E. Testick's) copy of his *Flora of Bristol* on sale for £75 with three handwritten letters from White, concerning the "hen and chickens" daisy found on the Bristol Downs in 1916, amongst other matters. Otherwise original copies sell for about £40 upwards (I had one recently for £2) and the excellent 1972 reprint for about £20 upwards. The *Coal-field Flora* is scarce and except for one copy at £38 in Bristol, it costs about £120.

Bristol & District Invertebrate Report, 2007

R.J. Barnett
City Museum & Art Gallery, Queen's Road, Bristol BS8 1RL
ray.barnett@bristol.gov.uk

INTRODUCTION

A year notable for its long but very wet summer although the flooding witnessed further north in Gloucestershire did not occur in our own district.

As now seems to be the norm, Red Admiral butterflies were seen in flight in January as were bumble bees. At present, bumble bees seem to be active throughout the winter months whenever the weather is fairly warm. Red Admirals have replaced Small Tortoiseshells and Peacocks as the most regularly reported butterfly in the winter. Humming-bird Hawk-moths were also seen early in the year, one on 31st January and another on 3rd February, and were probably over-wintering examples. These sightings were followed by others in March and April and as such the spring of 2007 seems to have been similar to 2004 when again over-wintered examples were present in numbers. A Small White on 4th February was most likely the result of a pupa in a very warm spot in a greenhouse rather than a symptom of climate change. The first Orange-tip of the year was reported on 2nd April. The micro-moth *Pyrausta despicata*, on the wing on 1st April, is perhaps though a result of a mild winter and higher than normal spring temperatures.

It was a poor year for moth numbers, not surprising given the weather. Immigrant species were also poorly represented with the appearance of the Great Brocade being the most interesting. Examples of the Double-line were also considered to be due to migration within the British Isles.

The most significant issue worth recording is the continued invasion into the district by insect species, nearly always from the south or southeast, which are either expanding from previously restricted endemic populations, or which are the result of species native to the European mainland establishing themselves in the British Isles and then expanding, or which are pestiferous species of accidental introduction into the country and are now spreading. Examples of the native species expanding northwards and westwards (presumably due to mild temperatures, particularly the lack of prolonged winter frosts) include Roesel's Bush-cricket and Brassica Bug. Recent colonists from Europe include the Small Red-eyed Damselfly and Southern Oak Bush-cricket. Pest species include the Rosemary Leaf Beetle and, perhaps more significantly, the Harlequin Ladybird. The speed with which this beetle has arrived and established itself in large numbers is startling. Whether its populations will impact on native ladybird and other insect species remains to be seen.

Plate 1 Adder`s-tongue Spearwort, flower. H Willmott

Plate 2 Adder's-tongue Spearwort, floating leaf, winter H Willmott

Plate 3 Giant Hogweed on the bank of the Frome central Bristol R Bland

Plate 4 Bristol Rockcress, Suspension Bridge garden R Bland

Plate 5 Chalkhill Blue, The Gulley, Bristol Downs . See p 67 Hugh Welford

Plate 6 Small Blue, The Gulley, Bristol Downs. See p 67 H Welford

Plate 7 White-legged Damselfly. Tony Cottrell

Plate 8 Raft Spider, Shapwick Heath. See p75 J Barnett

Plate 9 Alophora hemiptera See p 74 J Sparks

Plate 10 Hoverfly on Hemp Agrimony Tony Cottrell

Plate 11 Harlequin Ladybird larva See P 71 R Muston

Plate 12 Harlequin Ladybird Pupae See P 71 R Muston

Plate 13 Hoverfly R Muston

Plate 14 Humming-bird Hawkmoth See P70 R Muston

Plate 15 Beech clinging to an eroding slope, Downend R Bland

Plate 16 The Red Oak shows its glory on the Downs R Bland

Mild temperatures therefore seem to be allowing new species to arrive in our district. What is harder to monitor is whether species endemic to our district are also disappearing (perhaps northwards). At present some species seem to be declining but whether this is due to climate change or other reasons is very hard to tell. As always the amount of invertebrate recording is relatively small and new discoveries are far easier to spot than declining numbers of a well known species. The Section's field trip to Shapwick Heath reaffirmed the great importance of some nature reserves as centres of invertebrate biodiversity but even in areas of urban deprivation, alongside a busy motorway, Lawrence Weston Moor also revealed very localised species still surviving in pockets of interesting and important habitat.

The rediscovery of both the Small Blue and the Chalkhill Blue butterflies in the Avon Gorge after an apparent absence of many years was surprising and genuinely exciting. Assuming these were not the results of captive bred releases (which is always a possibility however slim) then the sightings are a wonderful piece of evidence to support the management of the site which has aimed in recent years to reduce the scrub and tree growth which has shaded out the herb layer, comprising rare endemic plant species but also low-growing plants which are the food plants of rare invertebrates. If having been present in the Gorge at low numbers all this time or to have re-colonised naturally from other populations, it is excellent news that these butterflies have been spotted again so close to the city centre.

Monitoring invertebrate populations has perhaps never been more important or useful as a means of reflecting changes in our environment, particularly in the climate, but also in terms of the success or otherwise of our stewardship of the natural world. More and more websites are appearing which include photographic representation of insects and, although accurate identification for very many species may always need a specimen under a microscope, this resource is opening up access to identification for a much larger community than ever before. It is to be hoped that it will lead to a new generation of invertebrate specialists.

My thanks to all who have submitted records directly to the Society (particularly to Rhian Rowson, Robert Cropper, Geoff Sorrell, Paul Chadwick, John Martin, Jon Mortin and John Burton) the Bristol Regional Environmental Records Centre (BRERC) and to the Bristol Wildlife e-group. The importance of receiving, not just the records picked out here, but those of perhaps less noteworthy species cannot be understated in terms of monitoring the ever changing status of the invertebrate fauna.

Scientific nomenclature follows that given in Bradley (2000), Brooks (1997), Chandler (1998), Duff (1993), Fitton *et al* (1978) and Potts (1964).

INSECTA

Odonata (damselflies and dragonflies)

Variable Damselfly *Coenagrion pulchellum* (Vander Linden) Shapwick Heath NNR, Somerset ST42 40 (vc 6) 21 and 26 May 2007 Ray Barnett *et al.* Many seen across the reserve, including the blue form of the female. Nationally Notable (**Nb**), the Somerset Levels are a stronghold for this very local species. The blue form of the female has black markings on the 2nd segment which are reminiscent of the male Southern Damselfly (*C. mercuriale*) a species not found locally.

Red-eyed Damselfly *Erythromma najas* (Hansemann) Shapwick Heath NNR, Somerset ST 427 410 (vc 6) 21 and 26 May 2007 Ray Barnett *et al,* several seen on lily pads on the main rhyne; Tealham Moor, Somerset ST412 456 (vc 6) 9 June 2007 Robert Cropper, a few males resting on Duckweed; Bath University Campus ST772 644 (vc 6) 29 August 2007, 30 August 2007, 1 September 2007 Dr Robert Kelsh. A species widespread across the Levels.

Small Red-eyed Damselfly *Erythromma viridulum* (Charpentier) Orchard Pools, Severn Beach, South Gloucestershire ST54 83 (vc 34) 11 August 2007 John Martin, 16+ seen where JM found them for the first time last year including several in tandem and ovipositing; Bath University Campus ST772 644 (vc 6) 29 August 2007 5 individuals including ovipositing female, 30 August 2007, 1 September 2007 Dr Robert Kelsh. First noted in the British Isles in 1999 and first recorded as breeding in 2002, the species has undergone rapid colonisation, spreading out from south east England. Recorded in our region for the first time in 2006, the 2007 record confirms a breeding population. Smaller than the Red-eyed Damselfly it also is on the wing later in the year (late July/August) but the two species can fly together.

Red-veined Damselfly *Sympetrum fonscolombii* (Selys) Warren Farm, Brean, Somerset ST303 568 June 2007 John Martin, 2 males seen. This immigrant is becoming more regularly seen.

Lesser Emperor Dragonfly *Anax parthenope* (Sélys) Chew Valley Lake, Bath & North East Somerset ST 56 58 (vc 6) 6 August 2007 per Bristol Wildlife e-group. First recorded in the British Isles in 1996 this species is now a frequent immigrant which has been recorded breeding in some sites in the UK. Regularly seen in our region in recent years.

Southern Oak Bush-cricket *Meconema meridionale* (Costa) St Andrews, Bristol ST59 75 (vc 34) 31st October 2007 Roger Edmondson. Noted in the recorder's garden, this is the first record for vice county 34 (West Glos.) and the Bristol district. It was first discovered in the British Isles in 2001 and can be distinguished from the adult Oak Bush-cricket (*M. thalasinum*) by the much reduced wings and the shape of the cerci or ovipositor. As it obviously cannot fly, it is likely that it is colonising the country by hitching lifts with unwitting human couriers.

Roesel's Bush-cricket *Metrioptera roeselii* (Hagenbach) Newton St Loe, Bath ST702 653 (vc 6) 16 July 2007 Mike Williams (per Bristol Wildlife E-group). This is thought to be the first record for "Avon" of this species which has been rapidly expanding it s range. Previously a southern and south eastern species it has now reached the Midlands and parts of Wales. Its expansion may be linked to climate change.

Great Green Bush-cricket *Tettigonia viridissima* Linnaeus Shapwick Heath NNR, Somerset ST425 411 (vc 6) 26 May 2007 Ray & Jim Barnett. Two larvae swept near entrance to reserve. The largest native resident species of Orthoptera. Commonest relatively close to coastlines it is found locally on the Somerset Levels and reaches up towards Portishead.

Dermaptera (earwigs)

Lesne's Earwig *Forficula lesnei* (Finot) Hengrove Park, Bristol ST583 684 (vc 6) 6 September Rupert Higgins. This species has been increasing from the south. This is the 7th record, from 3 sites within the "Avon" area but it is likely to be overlooked.

Hemiptera (true bugs)

Tortoise Bug *Eurygaster testudinaria* (Geoffrey) The Gully, Bristol Downs ST563 745 (vc 34) 5 June 2007 Ray Barnett. One swept, perhaps increasing in abundance in the region.

Brassica Bug *Eurydema oleracea* (Linnaeus) The Gully, Bristol Downs ST56 74 (vc 34) 19 April 2007 Robert Cropper, one on *Alliaria petiolata*; Lawrence Weston Moor, Bristol ST537 784 (vc 34) 29 April 2007 Ray Barnett one swept just outside the reserve on the edge of allotments; The Gully, Bristol Downs ST563 745 (vc 34) 5 June 2007 Ray Barnett, three swept. A scarce species across southern England and a remarkable and sudden appearance in our region. Has it become widespread locally without being previously noticed? Peter Brough in North Hants reported in spring of 2007 how the species had previously been very

scarce but was now suddenly present in large numbers. Another beneficiary of climate change? A species to look out for in 2008.
Legnotes picipes (Fallen) Shapwick Heath NNR, Somerset ST42 40 (vc 6) 21 May 2007 Ray Barnett *et al,* two swept. A local but easily overlooked shieldbug species which is associated with various bedstraws.

Corizus hyoscyami (Linnaeus) Midsomer Norton, Bath & NE Somerset ST6 5 (vc 6) 2 May 2006 Chris Targett. This striking black and red bug has largely been a species of the coast until the last few years when it has been reported from inland sites across southern England. This particular example was photographed.

Lepidoptera (butterflies)

Small Blue *Cupido minimus* (Fuessly) The Gully, Bristol Downs ST56 74 (vc 34) 2, 15 & 17 May and 2 June 2007 Hugh Welford. See Plate 6. An extremely localised and rare species in our region, although fairly easily overlooked. The last records for the Avon Gorge were in the 1950s and its rediscovery may reflect a small population that has been hanging on undetected which has benefited from the recent scrub clearance which has opened up the Gully again.

Chalkhill Blue *Lysandra coridon* (Poda) The Gully, Bristol Downs ST56 74 (vc 34) 3, 8, 22 August and 3 & 10 September Hugh Welford, see Plate 5. and at same site 11 September Jon Mortin. Last recorded in the Gully in 1991, as with the Small Blue a very local species which had been thought to have been lost from this site. The rediscovery of these two species in the Gorge, and in the same year, is remarkable.

Small Pearl-bordered Fritillary *Boloria selene* (Denis & Schiffemüller) Ashton Court Avon Wildlife Trust NR, Bristol ST54 72 (vc 6) 5 May 2007 via Polly Glazebrook. A very unusual species in our region now, this record presumably represents a wandering individual, worth looking for again in 2008 at this site.

Dark Green Fritillary *Argynnis aglaja* (Linnaeus) Ashton Court Meadow NR, Bristol ST54 72 (vc 6) 9 June 2007 Hugh Welford, one seen; Bristol Downs ST563 742 (vc 34) 23 June 2007 Rob Laughton *et al,* one seen. Thinly scattered across the region, a species which does wander and so has the potential to found new colonies. In the mid-19th C this butterfly was a regular site on the Bristol Downs.

Wall *Lasiommata megera* (Linnaeus) Wall Common, Somerset ST25 45 (vc 6) Robert Cropper 3 May 2007, at least 6 seen. A butterfly which appears to have been declining in recent years and so populations should be monitored.

Grayling *Hipparchia semele* (Linnaeus) Brean Down, Somerset ST29 58 (vc 6) 4 August 2007 Robert Cropper two seen; Compton Hill, Somerset ST39 55 (vc 6)

25 August 2007 Robert Cropper, one feeding on *Cirsium acaulon*. Another declining butterfly species which could be easily lost.

Lepidoptera (micro-moths)

Adela croesella (Scopoli) Nailsea, North Somerset ST474 715 (vc 6) 3 June 2007 Ray Barnett one netted along hawthorn hedge. A very local species in our region. The larvae are thought to feed on various shrubs and in leaf litter so the food plant is not the limiting factor.

Eulamprotes atrella (Denis & Schiffemüller) Walton Common, Clevedon, North Somerset ST42 72 (vc 6) 11 August 2003 James McGill. Only recorded a few times before in the region.. The larvae feed on St John's Wort and the species is likely to be found elsewhere if searched for.

Elachista maculicerusella Bruand Pilning, S. Gloucestershire ST556 849 (vc 34) 13 June 2007 John Martin, a local species where Reed Canary-grass grows..

Agonopterix liturosa (Haworth) Walton Common, Clevedon, North Somerset ST42 72 (vc 6) 11 August 2003 James McGill. A poorly recorded species in our region, larvae on St John's Wort.

Dichomeris alacella (Zeller) Walton Common, Clevedon, North Somerset ST42 72 (vc 6) 11 August 2003 James McGill. A rare species whose larvae feed on lichens. This is probably the first record for vice-county 6 (North Somerset).

Cydia amplana (Hübner) Walton Common, Clevedon, North Somerset ST42 72 (vc 6) 11 August 2003 James McGill. A relatively new immigrant to the British Isles first recorded in our region in 2004.

Phlyctaenia perlucidalis (Hübner) Pilning, S. Gloucestershire ST556 849 (vc 34) 29 June 2007 John Martin. Seen at this garden site for several years now but otherwise very unusual in the area.

Lepidoptera (macro-moths)

Cistus Forester *Adscita geryon* (Hübner) Slopes of Broad Hill, South Gloucestershire ST767 864 (vc 34) 31 May 2007 John Martin, 2 seen. A day flying green moth related to the red and black burnet moths, Nationally Notable (**Nb**) but with several population son calcareous grassland in the region.

Six-belted Clearwing *Bembecia ichneumoniformis* (Denis & Schiffermüller) Filton, Bristol ST61 79 (vc34) 2007 Andy Pym, one found alive in a garden pond; Wick Quarry, Wick Golden Valley LNR, South Gloucestershire ST708 736 (vc 34) 8 July 2007 Ray & Jim Barnett, one or two swept. This species, which lives on the roots of birds' foot trefoil as a larva, has been shown to less rare than previously thought. It is likely to be present in our area on sites where there is good quality calcareous grassland.

Small Eggar *Eriogaster lanestris* (Linnaeus) Pilning, S. Gloucestershire ST556 849 (vc 34) 14 April 2007 John Martin, adult female to light; Easter Compton, South Gloucestershire ST57 82 (vc 34) 5 June 2007 John Burton, two larval webs full of frass but no larvae in a hedgerow; Appledoor Quarry, Long Sutton, Somerset ST48 26 (vc 6) 16 June 2007 Robert Cropper, larval web on hawthorn bush. A Nationally Notable (**Nb**) species which has an important population in our area, most in a strip running parallel to the Severn Estuary coastline.

Oblique Carpet *Orthonama vittata* (Borkhausen) Blake's Pool, North Somerset ST37 66 (vc 6) 27 July 2003 Paul Chapman. Only otherwise recorded from Kenn Moor on the North Somerset levels in the "Avon" area in recent years.

Chalk Carpet *Scotopteryx bipunctaria* (Denis & Schiffemüller) ssp. *cretata* (Prout) Goblin Combe, North Somerset ST477 652 (vc 6) 11 August 2003 Rupert Higgins. This species was one of the target species for National Moth Night for 2007, of which this moth trapping meeting formed a part. A localised Nationally Notable (**Nb**) species which is still found in the region at various sites.

Cypress Carpet *Thera cupressata* (Geyer) Pilning, S. Gloucestershire ST556 849 (vc 34) 14 October 2007 John Martin; Clevedon ST4 7 (vc 6) 2007 Paul Chapman, at MV light. First recorded in the area in 2006 but increasing in numbers. The Pilning record is the first for Gloucestershire and therefore vice county 34 (West Gloucestershire).

Pauper Pug *Eupithecia egenaria* Herrich -Schaffer Leigh Woods NNR, North Somerset ST554 731 (vc 6) 18 May 2006, Mike Bailey, Dave Pritchard, Andy Pym & Ray Barnett. Confirmed by gen. prep., this very localised species is a speciality of Leigh Woods where the larvae feed on Small-leaved Lime.

Peacock Moth *Macaria notata* (Linnaeus) Walton Moor, Clevedon, North Somerset ST43 72 (vc 6) 8 June 2003 Paul Chapman. One of the handful of confirmed records of this moth which is similar to the commoner (although still localised) species, the Sharp-angled Peacock.

Death's-head Hawk-moth *Acherontia atropos* (Linnaeus) Clevedon, North Somerset ST4 7 (vc 6) 16 July 2003 per Jane Memmott. One found alive on a wall. This fabulous and famed moth appears now and again as an immigrant in our region.

Pine Hawk-moth *Hyloicus pinastri* (Linnaeus) Westerleigh Crematorium ST69 79 (vc 34) 11 July 2007 Gordon Youdale (via Bristol Wildlife E-group). The third record for the Bristol region the previous being from 1996 and 1997. Perhaps surprising that this impressive moth has not become established since its first arrival as it has been expanding from its stronghold in central southern England.

Hummingbird Hawk-moth *Macroglossum stellatarum* (Linnaeus) Mangotsfield, Bristol ST6 7 (vc34) 15 April 2003 Denise Whittle. A possible over-wintering example following emergence from hibernation. See plate 14.

Maple Prominent *Ptilodon cucullina* (Denis & Schiffermüller) Jenny Cridland's Copse, Watchet, Somerset 23 September 2007 Robert Cropper, a mature larva on maple in roadside hedge at margin of the copse. A local species with the nearest colonies to Bristol in the west of Somerset, as in this case. There are some suggestions that it may be expanding nationally and perhaps it may be found in future closer to Bristol and Bath.

Dotted Clay *Xestia baja* (Denis & Schiffermüller) Clevedon. North Somerset ST4 7 (vc 6) 14 July 2003 Paul Chapman. Surprisingly, this species (which is common nationally) is rarely recorded in the Bristol region.

Great Brocade *Eurois occulta* (Linnaeus) Pilning, S. Gloucestershire ST556 849 (vc 34) 23 August 2007 and 28 August 2007 John Martin, two different individual moths trapped. A Nationally Notable (**Nb**) species with resident populations in Scotland, elsewhere the moth appears occasionally as an immigrant. In our region there have only been a few previous records eg in 1938, 1955, 1973 and 2006.

Double Line *Mythimna turca* (Linnaeus) Clevedon, North Somerset ST4 7 (vc 6) 30 May 2003 & 12 June 2003 2007 Paul Chapman; Walton Common, North Somerset ST42 72 (vc6) 22 June 2003 Paul Chapman. A Nationally Notable (**Nb**) species with resident populations known from the south of Somerset and the south of Wales. The only known previous records from the "Avon" area have been from Weston-super-Mare in 1957 and Pilning in 2002, all presumed wanderers.

Obscure Wainscot *Mythimna obsoleta* (Hübner) Pilning, S. Gloucestershire ST556 849 (vc 34) 11 June 2007 John Martin; Clevedon, North Somerset ST4 7 (vc 6) 2007 Paul Chapman. Considered a local species nationally with concentrations in the south and south east and only thinly scattered populations in

the south west and Wales. There is a known strong population at Chew Valley Lake and others, like these, in the wetlands close to our coast line.

Crescent-striped *Apamea oblonga* (Haworth) Blake's Pool, North Somerset ST37 66 (vc6) 5 August 2003 Paul Chapman. A species of the coast but for which there are few recent records from our region.

Buttoned Snout *Hypena rostralis* (Linnaeus) Burnett Farm, near Bath ST66 65 (vc6) 15 May 2007 Liz Allen, one at MV light. A Nationally Notable (**Nb**) species which is also subject to a national Biodiversity Action Plan (BAP). The moth has been recorded from nearby Newton Park in 1997, 2000 and 2006 by Darrel Watts, suggesting a local resident population.

Coleoptera (beetles)

Dyschirius impunctipennis Dawson Berrow, Somerset ST228 51 28 July 2007 Robert Cropper, one running on shore. A very local Nationally Notable (**Nb**) species found in damp coastal sand and associated with *Bledius* spp.

Trechus rubens (Fabricius) Berrow, Somerset ST29 51 30 June 2007 Robert Cropper, 2 from beneath driftwood. A very rare species in Somerset, Nationally Notable (**Nb**).

Bembidion pallidipenne (Illiger) Berrow, Somerset ST28 51 29 July 2007 Robert Cropper, one beneath driftwood. A specialist Nationally Notable (**Nb**) of coast lines found under jetsam and seaweed. Berrow is one of the very few known local sites.

Harpalus ardosiacus Lutschnik Pawlett, Somerset ST295 428 6 October 2007 Robert Cropper, one from dung heap. A Nationally Notable (**Nb**) with very few records from Somerset.

Proteinus crenulatus (Pandellé) Arnos Vale cemetery, Bristol ST60 71 (vc 6) 8 March 2007 Andrew Duff. The first record of this Nationally Notable (**Nb**) rove beetle for Somerset (and vice county 6).

Anotylus clypeonitens (Pandellé) Arnos Vale cemetery, Bristol ST60 71 (vc 6) 8 March 2007 Andrew Duff. The second record in the British Isles of this rove beetle and the first ever record for vice county 6 (North Somerset) and indeed the whole of Somerset.

Ptinomorphus imperialis (Linnaeus) Shapwick Heath NNR, Somerset ST425 407 (vc 6) 26 May 2007 Ray Barnett *et al,* one swept from tall shrub under trees. A Nationally Notable (**Nb**) member of the family that includes the Common Furniture Beetle and the Death Watch Beetle. An attractively marked beetle associated with dead wood in old hedgerows and trees.

Harlequin Ladybird *Harmonia axyridis* (Pallas) Many recorders – widespread and well established (vc 34 and 6). See Plates 11, 12.
Ischnomera sanguinicollis (Fabricius) Lawrence Weston Moor, Bristol ST539 785 (vc 34) 29 April 2007 Ray Barnett. A Nationally Notable (**Nb**) species which breeds in dead timber, very few previous records for our region.

Meloe violaceus Marsham Cadbury Camp, Tickenham ST447 723 (vc6) 11 April 2007 Jim Barnett. A Nationally Notable (**Nb**) species of Oil Beetle last recorded on this site about 20 years ago.

Lime Beetle *Stenostola dubia* (Laicharting) Lawrence Weston Moor, Bristol ST539 785 (vc 34) 29 April 2007 Ray Barnett. A Nationally Notable (**Nb**) species of longhorn beetle first recorded in our region in 1990 expanding from its Midland populations but has not become well established as yet.

Plum Beetle *Tetrops praeusta* (Linnaeus) Lawrence Weston Moor, Bristol ST539 785 (vc 34) 29 April 2007 Ray Barnett. A small and easily overlooked longhorn beetle.

Plateumaris braccata (Scopoli) Berrow, Somerset ST29 51 30 June 2007 Robert Cropper, in some numbers over a wide area of dune marshes on *Phragmites*. Very few previous records in Somerset of this Nationally Notable (**Na**) species.

Cryptocephalus bipunctatus (Linnaeus) The Gully, Bristol Downs ST563 745 (vc 34) 5 June 2007 Ray Barnett. A Nationally Notable (**Nb**) leaf beetle, only known in Somerset from the Polden and Mendip Hills and in Gloucestershire from just a few scattered records, this is the first record known from the "Avon" area. An attractive black and red species.

Rosemary Leaf Beetle *Chrysolina americana* (Linnaeus) Clifton, Bristol ST567 736 (vc 34) 2 July 2007 S. Lang via Richard Bland, det. Ray Barnett. This species not only feeds on Rosemary but also on Lavender and is native to the Mediterranean (not America). It was first noted in the British Isles in 2003 and has been spreading since. The first record in our area was from near Bath (vice county 6, ST751 662 on 23 April 2006 by Paul Mabbott), the 2007 Clifton record is the first from vice county 34 (West Gloucestershire).

Poplar Leaf Beetle *Chrysomela populi* Linnaeus Barrow Gurney, North Somerset ST526 683 (vc 6) 13 June 2007 Cathy Mayne. A rather local species in Somerset and this is the first record held by BRERC for the "Avon" area as a whole. Found associated with poplars and willows.

Platyrhinus resinosus (Scopoli) Raven Rock, Wick Golden Valley LNR ST706 732 (vc 34) 15 April 2007 Neale Jordan-Mellersh, one found; Shapwick Heath NNR, Somerset ST425 407 (vc 6) 21 May 2007 Ray Barnett *et al,* one found under bark; Westacre Close, Westbury-on-Trym, Bristol ST573 786 (vc 34) 12 June 2007 John Burton, one in house. A Nationally Notable (**Nb**) species which mimics a bird dropping and is associated with the fungus *Daldina concentrica* on Ash. The tree and fungus are common in our area and the beetle is not that unusual locally.

Mononychus punctumalbum (Herbst) Nailsea, North Somerset ST474 715 (vc 6) 3 June 2007 Ray Barnett, one swept. A Nationally Notable (**Na**) species of weevil found on Stinking Iris and Yellow Flag. The populations on the Somerset Levels are probably nationally significant and this first known occurrence in the North Somerset area is encouraging.

Hymenoptera (bees, wasps and ants)

Brown Ant *Lasius brunneus* (Latreille) Weston Big Wood, North Somerset ST4 7 (vc 6) unknown date, Mike Lush. Mike reported the discovery of this ant, one of two species which make nests in the decaying heartwood of trees, in the newsletter of the Somerset Invertebrate Group (Spineless Wonder, issue 15, March 2007). Originally listed as a Nationally Notable (**Na**) species, Mike suggest this category should be reduced to at least **Nb** reflecting its recent expansion of range from the Home Counties, Gloucestershire and Worcestershire into Wiltshire, Cambridgeshire and now Somerset. This is the first record for Somerset and therefore vice county 6 (North Somerset) but is worth looking for – stare closely at rough bark on trees and look for them moving between the ridges!

Nomada hirtipes Pérez Nailsea, North Somerset ST474 715 (vc 6) 3 June 2007 Rhian Rowson. A Nationally Rare (**RDB3**) species which occurs sporadically across southern England. A parasite on the solitary bee *Andrena bucephala.*

Andrena humilis Imhoff Nailsea, North Somerset ST470 708 (vc 6) 3 June 2007 Rhian Rowson. A Nationally Notable (**Nb**) species of very local occurrence, recorded by Dave Gibbs at Troopers Hill in Bristol since 1998 and now at Nailsea, so perhaps more colonies will come to light if looked for.

Melitta leporina (Panzer) Nailsea, North Somerset ST474 715 (vc 6) 3 June 2007 Rhian Rowson. Although scattered across southern England and Wales, the strongest populations are in the south east of England.

Coelioxys conoidea (Illiger) Berrow, Somerset ST29 51 (vc 6) 28 July 2007 female flying around *Megachile leachella* colonies on foredunes. Robert Cropper. A cuckoo bee and, as with *Andrena humilis*, a species which has previously been recorded at Troopers Hill in Bristol (1999).

Coelioxys elongata Lepeletier Burnham-on-Sea, Somerset ST311 491 (vc 6) 8 June 2007 Robert Cropper female at *Lotus corniculatus* in garden. A clepto-parasite of *Megachile*, leaf cutter bees, thinly scattered across southern England.

Colletes hederae Schmidt & Westrich Brean Down, Somerset ST29805 58778 and ST30081 58780 (vc 6) 6 October 2007 and 4 November 2007 Robert Cropper, large numbers of females at ivy blossom. Only described as new to science in 1993 this bee is a recent colonist of the British Isles. It should be looked for in the late summer on ivy blossom.

Diptera (true flies)

Ox Warble Fly *Hypoderma bovis* (Linnaeus) Westacre Close, Westbury-on-Trym, Bristol ST573 786 (vc 34) 7 June 2007 John Burton, one seen. This fly is a serious economic pest of cattle and there have been many attempts to completely exterminate it from the UK. Both dairy and beef cattle can injure themselves attempting to avoid the buzzing flies in addition to the subsequent damage caused by the developing larvae under the skin. The British population of flies has been severely reduced by eradication programmes particularly since the 1970s and so it is not a common species for the entomologist to encounter.

Parhelophilus consimilis (Malm) Shapwick Heath NNR, Somerset ST425 407 (vc 6) 21 May 2007 Ray Barnett *et al.* *Parhelophilus* sp. common amongst yellow flag, one specimen taken for identification was of this Nationally Vulnerable (**RDB2**) species. Since that category was assigned to the species it has been found to be not quite as rare as originally thought but it is still an extremely local species and the levels are a strong and important site for it.

Volucella inanis (Linnaeus) The Gully, Durdham Down, Bristol ST563 746 (vc 34) 23 August 2007 Jon Mortin, one adult. Recently colonised the city, previously largely confined to the south east of England where it was considered Nationally Notable (**N**). Not to be confused with the similar *Volucella zonaria* which is very well established within Bristol and other local conurbations.

Alophora hemiptera (Fabricius) Shapwick Heath NNR, Somerset ST423 411 (vc 6) 21 May 2007 Ray Barnett *et al,* one female netted on umbels at entrance to reserve. This tachinid fly parasitizes various hemipteran bugs. There are few records locally of this striking species, Walton-in-Gordano being one other known locality closer to Bristol. See Plate 9.

Nemotelus notatus Zetterstedt Sand Bay, North Somerset ST3365 (vc 6) 14 July 2007 Robert Cropper, female on *Tripleurospermum maritimum.* Strongly associated with coastal and estuarine habitats where the larvae live in saline pools.

Odontomyia ornata (Meig.) Tealham Moor, Somerset ST4044, ST4045, ST4145 (vc 6) 9 June 2007 Robert Cropper, good numbers over a wide area mostly on umbels of *Oenanthe crocata.* A speciality of the Somerset Levels with its other stronghold being the Gwent Levels. A species which resembles a *Stratiomys* species of soldierfly.

Stratiomys singularior (Harris) Shapwick Heath NNR, Somerset ST427 410 (vc 6) 26 May 2007 Ray & Jim Barnett, two on umbels alongside main rhyne. A Nationally Scarce (**N**) species which is most often associated with the coast on brackish marshes although it is known from inland sites including the Somerset levels.

Arachnida

Raft Spider *Dolomedes fimbriatus* (Clerk) Shapwick Heath NNR, Somerset ST425 407 (vc 6) 21 and 26 May 2007 Ray Barnett *et al,* several seen. See Plate 8. These spectacular spiders can be found on the surface of the water or on the rhyneside vegetation at sites in the Somerset levels. A local species across the country with strongholds in Hampshire for example.

Mollusca

Silky Snail *Ashfordia granulata* (Alder) Kensington Meadows, Bath & NE Somerset ST761 660 (vc 6) 18 October 2007 Jon Mortin, several seen. A Biodiversity Action Plan species in both Bath & NE Somerset and for the whole of "Avon". This is the 5th site known for the species on the BRERC database.

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Bristol Mammal Report 2007

Compiled by David P. C. Trump
Windrush, West End Lane, Nailsea, Bristol BS48 4DB
e-mail: d.m.trump@tinyworld.co.uk

INTRODUCTION

The intention of this mammal report is to be a wide-ranging review of the records and studies of mammals in and around the Bristol area and to report on significant issues and events affecting British mammals in 2007. The former county of Avon covers an area of approximately 1300 square kilometres, and so the number of 1 km squares for which records have been received gives an indication of the abundance of each species. The more common species are likely to be under-recorded. Where given, all grid references are for the 100 km grid square ST. The differences between the years are likely to be due to changes in numbers and locations of recorders rather than changes in mammal abundance or distribution. Provided the submitter of a record gives permission, all records are submitted annually to the Bristol Regional Environment Records Centre (BRERC).

REPORTS ON MAMMALS

INSECTIVORA (Hedgehogs, Shrews and Moles)

Hedgehog *Erinaceus europaeus*

Year	2000	2001	2002	2003	2004	2005	2006	**2007**
1 km squares	97	38	45	26	26	39	14	24

There were 29 road casualty records in 2007. No records for January, March, October and December.

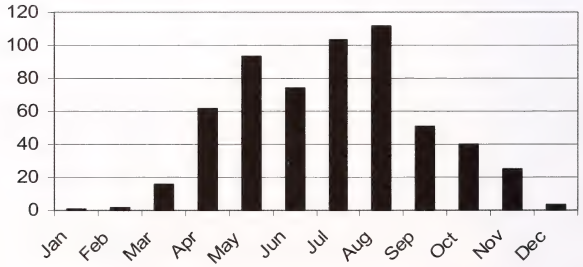

Figure 1. Number of Hedgehog Road Casualty Records per Month 1996-2007.

Twelve years of data and 582 records of road casualty Hedgehogs show two main peaks, a smaller peak in May when most Hedgehogs have emerged from hibernation and a larger peak in July/August when the young of the year disperse (Fig. 1). The decline in road casualties seen in 2006, suggesting a population decline, appears to have reversed.
Recorded by RLB, PJC, JMort, EN, JR, DT, MT,

Mole *Talpa europaea*

Year	2000	2001	2002	2003	2004	2005	2006	**2007**
1 km squares	151	69	63	56	63	90	71	81

The vast majority of records were of mole hills, generally the only evidence that moles are present in a particular area.
Recorded by RLB, PJC, JR, DT.

Common Shrew *Sorex araneus*

Year	2000	2001	2002	2003	2004	2005	2006	**2007**
1 km squares	1	3	4	5	2	6	6	**3**

Records included one caught alive in a *Longworth* live-capture trap at St George's Flowerbank, Easton-in-Gordano (5175) and three at Clapton Moor Nature Reserve (4573).
Records from J&SP, LR, DT.

Pygmy Shrew *Sorex minutus*

Year	2000	2001	2002	2003	2004	2005	2006	**2007**
1 km squares	0	0	4	6	0	0	0	**1**

Recorded only from Clapton Moor Nature Reserve (4573). One caught in a *Longworth* trap in June and three in November.
Records from DT.

CHIROPTERA (Bats)

Lesser Horseshoe Bat *Rhinolophus hipposideros*

Year	2000	2001	2002	2003	2004	2005	2006	**2007**
1 km squares	3	0	9	4	0	7	0	**1**

Recorded from a single 1-km square, Tyntesfield (5071). Up to 80 emerging from roost on 8 August.
Record from ABG/DT.

Serotine ***Eptesicus serotinus***

Year	2000	2001	2002	2003	2004	2005	2006	**2007**
1 km squares	0	0	2	2	0	1	1	**1**

Two heard on a bat detector at Tyntesfield (5071) on 8 August.
Record from DT/ABG.

Noctule ***Nyctalus noctula***

Year	2000	2001	2002	2003	2004	2005	2006	**2007**
1 km squares	1	3	4	4	4	0	1	**2**

Two heard on a bat detector at Tyntesfield (5071) on 8 August and four at Troopers Hill (6373) on 23 August.
Record from JMort, DT.

Common Pipistrelle ***Pipistrellus pipistrellus*****, Soprano Pipistrelle** ***Pipistrellus pygmaeus*** **and Pipistrelle sp.** ***Pipistrellus sp.***

Year	2000	2001	2002	2003	2004	2005	2006	**2007**
1 km squares	3	4+	12	5	6	9	4	**5**

Up to 20 Common Pipistrelles seen/heard on bat detectors at Tyntesfield (5071) on 8 August. Up to 10 Soprano Pipistrelles heard at Tyntesfield (5071) on 8 August. All other records were of 3 or less individuals.
Records from ABG/DT, KG, JR, JMort, JR, J&SP.

Brown Long-Eared Bat ***Plecotus auritus***

Year	2000	2001	2002	2003	2004	2005	2006	**2007**
1 km squares	0	0	1	1	0	0	0	**2**

A single bat picked up on a bat detector at Tyntesfield (5071) on 8 August. Adults and juveniles seen/heard during the summer at Tickenham Ridge (4472).
Records from ABG/DT, KG.

LAGOMORPHA (Rabbits and Hares)

Brown (European) Hare ***Lepus europaeus***

Year	2000	2001	2002	2003	2004	2005	2006	**2007**
1 km squares	34	11	10	24	6	10	12	**10**

Three adults seen at Blagdon (5059) on 3 February, four at Norton Hawkfield (5864) on 20 April, two at Compton Dando (6564) on 16 May, three at Elm Farm, Burnett (6665) on 12 June. All other records were of single animals.
Records from PJC, PF, JMort, J&SP.

Rabbit *Oryctolagus cuniculus*

Year	2000	2001	2002	2003	2004	2005	2006	**2007**
1 km squares	105	19	36	52	68	76	48	**23**

The lowest number of records since 2001, likely to be as a result of under-recording rather than a genuine decline
Records from RLB, JB, PJC, JMort, EN, J&SP, JR, DT, MT.

'Relief as roundabout rabbits are saved' (Bristol Evening Post 19 September) A colony of rabbits has been saved after it was feared that they were facing extermination as part of a revamp of roundabout in Bradley Stoke. A local councillor was reported to have said 'Personally, I would like to see more rabbits on roundabouts in the area because they actually work to reduce the speed of traffic as people slow down to look at them.'

RODENTIA (Rats, Mice, Voles and Squirrels)

Brown Rat *Rattus norvegicus*

Year	2000	2001	2002	2003	2004	2005	2006	**2007**
1 km squares	17	6+	13	9	9	7	6	**8**

Records from RLB, PF, JMort, JR.

'Warning over the danger from rats' (Western Daily Press 28 July) People living in flood-hit areas of Gloucestershire were warned to be on the alert for rats. Rats (and other 'vermin') were expected to move above ground after being flushed out of their burrows by the flood waters increasing the threats of illness such as Weil's disease transmitted to humans via contaminated water.
'Back from the dead' (BBC Wildlife July 2007) – Manx shearwaters are making a dramatic recovery on Lundy in the Bristol Channel following the successful eradication of the **Black Rat *Rattus rattus***. There are now more than 100 pairs nesting on the island.

Grey Squirrel *Sciurus carolinensis*

Year	2000	2001	2002	2003	2004	2005	2006	**2007**
1 km squares	77	50	37	59	62	83	60	**68**

Records from RLB, JB, PF, KG, J&SP, DT, MT.

Bank Vole *Clethrionomys glareolus (3,3,1,5,6,1,4)*

Year	2000	2001	2002	2003	2004	2005	2006	**2007**
1 km squares	4	1	6	5	1	3	3	**5**

Three caught in *Longworth* traps at Clapton Moor Nature Reserve (4573) in June. Four caught in *Longworth* traps at St George's Flowerbank (5175) in November. Records from KG, LR, DT, MT.

Short-tailed Field Vole *Microtus agrestis*

Year	2000	2001	2002	2003	2004	2005	2006	**2007**
1 km squares	2	2	7	5	1	3	4	**1**

Recorded from only one 1-km square, Pilning (5585).
Record from JR.

Common Dormouse *Muscardinus avellanarius*

Year	2000	2001	2002	2003	2004	2005	2006	**2007**
1 km squares	?	0	1	1	0	0	5+	**2**

Recorded from Leigh Woods (5574 and 5673) July to October during nest tube surveys. Two of the observations were of nests and five individuals were seen.
Records from HB/SJ/MB/UD/MH.

Wood Mouse (Long-tailed Field Mouse) *Apodemus sylvaticus*

Year	2000	2001	2002	2003	2004	2005	2006	**2007**
1 km squares	6	7	5	9	3	7	5	**9**

Eleven individuals were caught in *Longworth* traps in hedgerows at Clapton Moor Nature Reserve (4573) in June, 24 in November. Eighteen were caught in *Longworth* traps at St George's Flowerbank (5175) in November.
Records from:- KG, EN, J&SP, JR, LR, JS, DT).

House Mouse *Mus domesticus*

Year	2000	2001	2002	2003	2004	2005	2006	**2007**
1 km squares	3	4	1	3	1	3	2	**1**

Records from only one 1-km square at Pilning.
Records from JR.

SMALL MAMMAL STUDIES

A small mammal trapping exercise was undertaken at the Avon Wildlife Trust's Clapton Moor Nature Reserve in June and November as part of the Mammal Society's Small Mammal Pilot Monitoring Project. This follows on from a long-term study begun in 2002 (Trump 2003) and continued in 2005 and 2006 (Trump 2006).

The project involved testing five different techniques for investigating the small mammals in an area: extensive and intensive trapping using *Longworth* live-capture traps; a harvest mouse nest transect survey; a field vole signs survey and setting of bait tubes to detect water shrews (and other small mammals).

The intensive trapping involved setting 10 groups of four traps at 10 metre intervals in hedges with the traps being set for two nights; the extensive trapping involved setting 10 individual traps at 10 metre intervals in hedges for a single night. Lack of time meant that the harvest mouse and field vole surveys were not undertaken. The results of the analysis of small mammal faeces found in the bait tubes (short lengths of plastic pipe baited with casters – blowfly pupae – placed at 10 metre intervals in suitable habitat) are still awaited.

The intensive trapping results were as follows:-

June	7 wood mice, 3 bank voles 1 pygmy shrew
November	14 wood mice, 3 common shrews, 3 pygmy shrews.

The extensive trapping results were as follows:-

June	Trap line 1	4 wood mice
November	Trap line 1	1 wood mouse
	Trap line 2	3 wood mice
	Trap line 3	6 wood mice and 1 bank vole

CETACEA (Whales, Dolphins and Porpoises), and PINNIPEDIA (seals)

Harbour Porpoise *Phocoena phocoena*

Year	2000	2001	2002	2003	2004	2005	2006	**2007**
1 km squares	0	0	0	0	1	0	1	**1**

One reported off Portishead during the summer. Unknown source.

Grey Seal *Halichoerus grypus*

Year	2000	2001	2002	2003	2004	2005	2006	**2007**
1 km squares	3	5+	0	0	1?	0	0	**2**

An individual seen off New Passage (5486) on 31 July and another seen off Royal Portbury Docks (4978) on 4 August – possibly the same individual?
Records from JMart/BL, CSt/SH.

CARNIVORA (Carnivores)

American Mink *Mustela vison*

Year	2000	2001	2002	2003	2004	2005	2006	**2007**
1 km squares	3	0	2	0	1	2	3	**3**

Sightings from Hinton Charterhouse (7756) and Midford Brook (7660 and 7661).
Records from MP, ATAA/MS.

Stoat *Mustela ermina*

Year	2000	2001	2002	2003	2004	2005	2006	**2007**
1 km squares	10	4	3	1	0	4	4	**2**

Sightings from West End Nailsea (4569) and Pilning (5484).
Records from JR, MT.

Weasel *Mustela nivalis*

Year	2000	2001	2002	2003	2004	2005	2006	**2007**
1 km squares	10	3	7	6	4	7	6	**3**

Sightings from Tickenham Ridge (4472), Chew Lake (5760) and Barrow Court (5168).
Records from RLB, PF, KG.

European Polecat *Mustela putorius*

Year	2000	2001	2002	2003	2004	2005	2006	**2007**
1 km squares	?	2	2	0	0	1	1	**2**

Records, both road casualties from the M5 at Clapton (4573) on 29 March, and Midford (7659) on 28 September.
Records from JP, MP.

Otter *Lutra lutra*

Year	2000	2001	2002	2003	2004	2005	2006	**2007**
1 km squares	24	2+	25	19+	28+	36+	28+	**25+**

Sightings of otters at the following sites:-
An individual seen in the River Avon in Bristol (5972) on 13 February, four seen on the River Frome at Iford (8059) early in 2007, one seen on the River Avon at Claverton on 15 March, an adult seen close to the minor bridge over the M5 at Clevedon (4169) on 2 April, an adult and two cubs seen on the Midford Brook (7761) on 1 May and an individual seen on the Mells Stream west of Frome on 19 July.

Road casualty otters were found at the following locations:- on the River Trym in Bristol on 17 January, at Chew Stoke on 21 January and near Frome, also on 21 January.
Records from BAOS (Hannah Watts), CS, ATAA/MS.

Otters on the Bristol Avon

The following information is summarised from the Bristol Avon Otter Survey report provided by Hannah Watts.

Bristol Frome Winterbourne Down (6579) – spraints. Brooks Lake (6281) - spraints
By Brook Drewitts Mill (8369) – spraints; Box Mill (8268) – spraints; Middle Hill Gauge (8168) – spraints.
Corston Brook Middle Weir (6964) – spraints; Railway bridge (7065) – padding.
Mells Stream Edford Wood (6648) – spraints; Mells Bridge (7248) – spraints and padding; Mells Pond (7348) – spraints.
River Avon Lockkeeper, Keynsham (6569) – padding.
River Boyd Boulders 1&2 and Weir Ramp (7073) – spraints.
River Chew Denny Lane and Flume (5761) – spraints.
River Frome Spring gardens (7749) – spraints, padding and digging.
Siston Brook Londonderry Wharf (6669) – padding.

Badger *Meles meles*

Year	2000	2001	2002	2003	2004	2005	2006	**2007**
1 km squares	77	42	50	31	37	48	29	**56**

Forty road casualties, recorded in every month except November and December.
Records from the following RLB, PJC, KG, DM, JMort, EN, J&SP, JR, TS, DT, MT.
Road casualties.

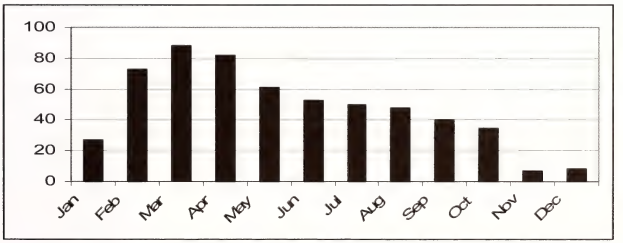

Figure 2. Number of Badger Road Casualty Records 1996-2007.

Twelve years of Badger road casualty figures with 432 records to date show a large peak around March/April (peak breeding season) with perhaps an indication of a smaller peak in August (dispersal of young) (Fig 2). There are few records between November and January. This is the time of year when Badgers are at their least active with the pregnant females underground in their setts prior to giving birth to cubs between January and March.

Since records of road casualty badgers were collected on a regular basis (from 1996), a number of 'hot-spots' are apparent, listed below. The results give an indication of the most hazardous places for badgers (and for road users) but are likely to be biased towards the routes driven by the regular badger road casualty recorders. This is particularly true of the roads around Nailsea, the M5 and the A370 where your county mammal recorder lives.

1–km square	Number of road casualty Badgers	Location/Notes
4169	**7**	M5 near Clevedon (the overbridge at ST414699 appears to be particularly hazardous)
4170	**4**	M5 junction 20 (Clevedon)
4271	**9**	M5 near Clevedon Court
4673	**4**	M5 near Clapton Court
4972	**6**	B3128 Wraxall
5072	**4**	B3128 Wraxall
5269	**11**	A370 Cambridge Batch (Long Ashton Bypass)
5369	**9**	A370 Barrow Wood (Long Ashton Bypass)
5471	**5**	B3128 at Ashton Court
5472	**4**	B3129 Ashton Court/Beggar Bush Lane
5484	**6**	A403/M49 Severn Beach
5570	**4**	A370 Long Ashton (bypass)
5571	**4**	A370/B3128 Long Ashton (bypass)/Bower Ashton
6469	**6**	A4 Keynsham Bypass
7476	**4**	A46 Dyrham Park
7757	**4**	B3110 Hinton Charterhouse
A further 19 1-km squares had 3 road casualty badgers, 50 1-km squares had 2 road casualty badgers and 133 1-km squares had 1 road casualty badger.		

Table 1. Numbers of road casualty badgers per 1-km square (1996-2007)

Which were the most dangerous roads for badgers in 2007? The most hazardous road appears to be the A370 (Ashton Gate to East Brent) with five road casualty badgers reported in 2007 (Table 2). 17 badgers have now been run over on the A370 in the four years 2004-7.

Road Name/ Number	*Location (in 'Avon')*	***2007***	*2006*	*2005*	*2004*
M4	Tormarton to Second Severn Crossing	**0**	0	1	0
M5	Falfield to Loxton	**2**	2	1	1
M48	M4 Awkley to Aust	**1**	0	0	0
A4	Avonmouth to Batheaston	**3**	0	1	0
A36	Bath to Hinton Charterhouse	**2**	0	0	0
A37	Temple Meads to Farrington Gurney	**1**	1	1	1
A38	Falfield to Churchill	**2**	2	1	1
A39	Corston to Hallatrow	**0**	0	1	0
A362	Farrington Gurney to Radstock	**1**	2	0	1
A368	Banwell to Marksbury	**2**	0	2	1
A369	Bower Ashton to Portishead	**0**	1	0	0
A370	Ashton Gate to East Brent	**5**	3	4	5
A46	Starveall to Bathampton	**0**	1	0	1
Old A46	Lambridge (Bath)	**0**	0	1	0
A403	Avonmouth to Aust	**1**	3	5	1
A420	Bristol to Marshfield	**0**	0	1	0
B3110	Bath to Hinton Charterhouse	**0**	0	1	1
B3114	Chew Magna to Chewton Mendip	**1**	2	0	0
B3124	Clevedon to Portishead	**0**	0	1	0
B3128	Bower Ashton to Stone-edge-batch	**4**	0	3	0
B3129	Abbots Leigh to Flax Bourton	**1**	1	0	0
B3130	Pensford to Clevedon	**3**	0	2	3
B3133	Clevedon to Lower Langford	**1**	0	0	0
B4055	Shirehampton to Pilning	**0**	0	4	1
B4058	Eastville to Charfield	**0**	1	0	0
Unspecified	Chew Valley area	**0**	0	9	0
Minor roads	Various locations	**10**	8	9	9

Table 2. Numbers of road casualty badgers on roads in the former county of Avon in 2004-07.

Badgers in a Pilning Garden

Jeff Rawlinson once again reported on the nocturnal activities of Badgers in a large rural garden at Pilning (5585). Much reduced badger activity reported for 2007 with a maximum of four badgers (two adults and two young) seen on 5 September. The railway embankment where the badgers' main sett was located had been re-profiled and the surface covered with chain-link mesh so it is likely that the badgers have moved elsewhere.

Badgers in the press

'Fresh call to cull badgers' (Bristol Evening Post May 11), *'Badgers back in the firing line – farmers seize on new report into bovine TB to step up calls for cull'* (Western Daily Press 12 May). Farming leaders in the west have made a fresh call for a badger cull to prevent the spread of tuberculosis to cattle. This follows the results of a new Central Science Laboratory (Defra) survey undertaken between the spring and autumn of 2006 which showed that badgers are now as common as foxes in parts of the countryside around Bristol. Researchers found that badger populations densities in open pasture were 4.3/square km in Devon, 3.3 per/square km in Gloucestershire, 2.9/square km in Cornwall and 1.5/square km in Herefordshire. The findings were refuted by badger watchers who claim that the dry spring of 2007 has led to a fall in the numbers of breeding adult badgers.

'Closer to the culling fields?' (BBC Wildlife May 2007) After a 10-year programme costing the taxpayer £48 million, the Government was reported to be nearly ready to decide how to tackle the problem of bovine TB – and whether badgers should be the fall guys. This was followed by *'Scientists defy badger cull'* (BBC Wildlife August 2007) – the final report by the government-appointed panel, the Independent Scientific Group, concludes that bovine TB should be tackled by better cattle husbandry. The Government's response is still awaited.

Red Fox *Vulpes vulpes*

Year	2000	2001	2002	2003	2004	2005	2006	**2007**
1 km squares	71	35	39	48	38	47	43	**27**

Records from RLB, JB, PJC, PF, KG, JMort, EN, JR, DT, MT.

Sarcoptic Mange and Foxes

The recent widespread outbreak of sarcoptic mange in British foxes is summarised in a paper by Carl Soulsbury *et al* (2007). Localised outbreaks have occurred sporadically in Britain during the past 100 years with the most recent large-scale outbreak occurring during the 1990s. Mange appeared in the foxes of Bristol in 1994 and spread through the city at a rate of 0.6-0.9 km/month, with a rise in infection of domestic dogs 1-2 months later. Juvenile and adult fox mortality

increased resulting in the population density declining by >95%. By 2004, the Bristol fox population density was only 15% of that in 1994.
Foxes were found within the 'City and County of Bristol' boundaries in the following 1-km squares:- 5277, 5673, 5674, 5675, 5778, 5873, 5968, 6072.

ARTIODACTYLA (Deer)

Roe Deer *Capreolus capreolus*

Year	2000	2001	2002	2003	2004	2005	2006	**2007**
1 km squares	51	20+	27	33	26	33	36	**35**

Groups of three or more seen at the following locations:- three at Tormarton (7878) on 31 December, three bucks and two does at Tickenham Ridge (4472) in May/June, three does at Flax Bourton (5159) on 11 January, seven adults at Stantonbury Hill (6763) and three does at Marskbury Plain (6561) on 18 February, four does at Compton Dando (6564) on 16 May, three does at Charlton Fields (6366) and five does at Queen Charlton on 17 November. Surprisingly only one road casualty record – at Marshfield (7673) on 23 August.
Records from RLB, JB, PJC, PF, KG, EN, J&SP, SPh, JR, DT, MT.

Chinese Muntjac Deer *Muntiacus reevesi*

Year	2000	2001	2002	2003	2004	2005	2006	**2007**
1 km squares		0	?1	1	3	2	1	**2**

Two records for the year when an individual was seen on 11 and 13 June at Wraxall (4872 and 4873) – probably the same animal.
Record from DM.

EXOTICS/BEASTS/FORMER NATIVE SPECIES

Big Cats
Reports of large beast/cats/panthers/leopards/pumas etc roaming the countryside attacking livestock continue to circulate in the press but as yet there have been no confirmed sightings.

Wild Boar *Sus scrofa*
Wild boar populations continue to thrive in Dorset and East Sussex/Kent with smaller populations in Hampshire and Devon and, closer to home in the Forest of Dean around Ross-on-Wye (BBC Wildlife November 2007).

MAMMALS IN RESIDENTIAL GARDENS

An investigation of the use of residential gardens by mammals in mainland Britain was reported on by Philip Baker and Stephen Harris (Baker and Harris 2007). A questionnaire was sent out to the public in wildlife and gardening magazines and via the Mammal Society. Nearly 4000 completed questionnaires were received and 22 species/species groups were recorded. Only six species/species groups (bats, foxes, grey squirrels, hedgehogs, mice and voles) were recorded as frequent visitors to >20% of gardens in the survey. All species/species groups appeared to be negatively affected by the increased fragmentation and reduced proximity of natural and semi-natural habitats, decreasing garden size and garden structure.
Garden use by mammals declined with increasing urbanisation for the majority of species groups, except foxes and grey squirrels. They conclude that the probable effects of the planned housing development programme in Britain are not likely to be beneficial to mammal populations.

NEW PUBLICATIONS

Following on from the very successful 'Where to Watch Birds in Britain & Ireland', 'Where to Watch Mammals in Britain & Ireland' by Richard Moores was published in 2007. The entries for 'Avon' are:-

1) The Gordano Valley (4373) where the highlights are listed as Serotine and Greater Horseshoe Bats which can be observed throughout the summer from the network of public footpaths that run through the valley.
2) Willsbridge Valley (6670). 'During the summer, small numbers of both Greater Horseshoe Bats and Noctules may be observed hunting insects in the valley. Other mammals present include Badgers and Red Foxes.

Other sites in the vicinity include Brean Down (2859) for Feral Goats, Badgers, Red Foxes and Weasels, and Mells Valley Special Area of Conservation (6547) for a range of bat species including Greater and Lesser Horseshoe Bats as wells as Natterer's, Noctules, Daubenton's and Common Pipistrelles.

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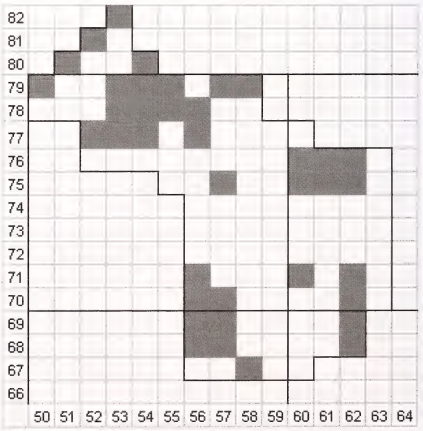
The distribution of Moles, Grey Squirrels and Rabbits in the city of Bristol 2000-2007.

R.L.Bland

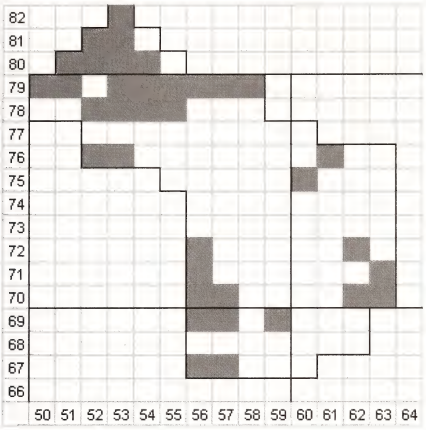
Over the past seven years I have been involved in a bird survey of the city of Bristol on a 1-km square basis, and, while wandering the streets of the city counting birds I have also noted mammals. The survey has been based on the BTO standard BBS methodology, which is that of walking two parallel transects in the breeding season through a 1-km square, counting all birds. There have also been winter visits to almost every square. This does not mean that the best habitat for mammal species is sought out, but in practice the transects are chosen to ensure that obvious sites for birds are included. There are 114 accessible squares in the city; 16 have been visited in only one or two years, 21 of them in either 7 or 8 years, and the remainder on between three and six occasions. The chance of encountering mammal species is not the same in each square. However as the city becomes increasingly densely developed the pressure on wildlife habitats grows, and a simple methodology of this sort can help to measure the impact of change.

I have encountered at least one of the three mammal species in all but 20 (18%) of the 114 squares. Grey Squirrels have been found in 64% of squares, Moles in 38% and Rabbits in 32%. 14 squares have all three species.

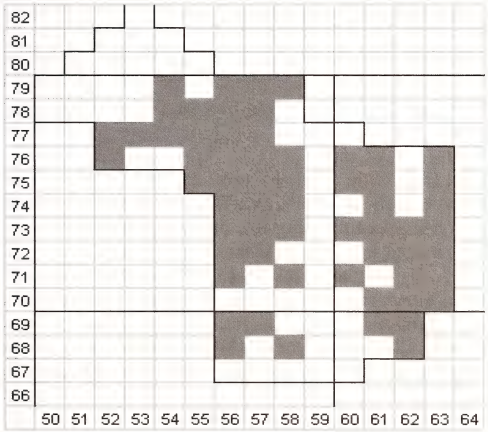
Molehills are consistently found in the same squares, indeed on the same small plots, year after year, and many go back at least forty years, though I have not used my early records in this summary. As they depend on worms they are concentrated on soft soils in river valleys and remnants of agricultural land.



Rabbits are seen less often, as they are very wary, but they still manage to flourish on wasteland all round the edges of the city



Squirrels are the most widespread, occurring in all woodlands and parks, though I have probably missed them in some of the most built up areas, and they seem to be absent from the Avonmouth region.



Some botanical curiosities in Nailsea

Terry Smith
t.a.smith@blueyonder.co.uk

Although Nailsea has many new houses and associated shops and offices, remnants of a very diverse flora can be found in various parts, dating back to the time when much of the land was occupied by the wildlife. Small areas of public land have been planted with ornamental shrubs and trees and the soil has sometimes retained seed of the native plants that once grew in profusion there. Even some of our gardens contain 'weeds' that are derived from the earlier pastures and some of these remnants are of considerable interest. Ruderal land (land which is of industrial origin) can also be particularly rich in unusual species, since competition with grasses is diminished due to the lack of nutrients.

The broomrapes are plants that grow parasitically on other plants and they are often overlooked as they have insignificant flowers and no leaves. They are not coloured green with chlorophyll so they appear to be rather brown and even moribund. Two species are found in Nailsea. Ivy Broomrape (*Orobanche hederae*) is an obligate parasite of Ivy and, as it happens, grows profusely in my own garden. It is also found in the shrubbery adjacent to the Glasshouse public house. Having scattered seed on a patch of Ivy in Stockway North Nature Reserve, I was glad to see that this has now also been established here. Until last year it could also be found in the small areas of land next to the Wessex Water Offices on Stockway North – that is until somebody treated the area with herbicide. This is often the fate of the plants growing in amenity land around our Town. Ivy Broomrape will apparently only parasitise the tetraploid Ivy known as *Hedera helix* var. *hibernica.*

Common Broomrape (*Orobanche minor*) can be found in the flower beds of 'The Laurels' nursing home on Brockway where it parasitises the shrub *Senecio greyii* cv Sunshine. I understand that Common Broomrape has a special affinity for this plant.

Another parasite, Hay Rattle (Yellow Rattle; *Rhinanthus minor*), can be found in Netcott's Meadow near to Backwell Lake. This is closely related to *Orobanche* and may be termed a hemi-parasite, since it is also capable of photosynthesis as it has chlorophyll. The winged seeds of this plant rattle in their pods when they are ripe – hence the name. Hay Rattle mainly parasitises a wide range of grasses (but bizarrely it will even parasitise other Hay Rattle plants!). It has been suggested that it could be used to reduce the vigour of grasses in wild-flower meadows. This plant also grows on the Glassworks site in Nailsea where it was introduced in a commercial batch of wildflower seed used to enhance the landscape there.

Other species found on the Glassworks site include Wall Lettuce (*Lactuca serriola*), otherwise known as the Compass Plant. This plant grows in many areas around the Town. In a hot summer the leaves on this Lettuce grow around the stem oriented north-south, which presumably enables the leaf to present the smallest area to the heat of the mid-day sun. Annual Mercury (*Mercurialis annua*) that has separate male and female plants also grows here. The male flowers arise vertically from the leaf axils and are very prominent. By contrast, the flowers on the female plants are quite insignificant The perennial Dogs Mercury (*Mercurialis perennis*) that grows in the shrubbery on Stockway North close to Somerfield supermarket, also has separate male and female plants, in common with other very different plants like Nettles, Holly, Yew, Poplar and Willow.

On a grassy bank near to the Towerhouse Surgery may be found Field Madder *(Sherardia arvensis*) with small mauve flowers, a close relative of Cleavers (*Galium aparine*), These species belong in the Rubiaceae, which also contains the coffee plant.

A number of unusual aliens may also be found around Nailsea under bird feeders and around pet shops, for which bird seed is often imported. Common Ragweed (*Ambrosia artemesiifolia*) and the grass *Digitaria* have grown under bird feeders on Stockway North Nature Reserve. The particularly aggressive alien New Zealand Pygmy Weed (*Crassula helmsii*) grows in the pond on this reserve. This plant will regenerate from single leaves that break from the stems very easily, and it is now in many natural waterways in the UK where it can form thick mats that suppress the native flora and it is very difficult to eradicate.

From the Archives

S. M. Taylor, Hon. Archivist

In the summer of 1958 three members of the Ornithological Section spent a birding holiday on Exmoor. In between enjoying the hospitality of Mrs Tucker at West Lucott Farm they tramped for miles over the moors and had many good sightings. One day, returning to lunch across Lucott Moor, they disturbed a Merlin from the heather. Its behaviour suggested a nest nearby. After a long search this was found beneath a big clump of heather and the five young were ringed. The party arrived very late for lunch. [Ten days or so later, the nest was photographed by Mrs M. L. Davis and the result appeared in the *Somerset Bird Report* for the year.]

In those days our Society occasionally arranged an overnight coach trip to see sunrise from the summit of Dunkery Beacon. Still in a state of euphoria, for ground-nesting Merlins are rare, the party composed over the next days the following ballad about such a trip, celebrating the repeated problems certain Society members had with bird identification. One of the trio and one of the eight experts mentioned are still with us.

DAWN ON DUNKERY

Or, the saga of a Chaffinch, with apologies, by Anon.

We all set forth on the All-night Trip, with R. F. Wills in charge of the ship.
We heard the Nightjars on Shapwick Heath (or was it someone's chattering teeth?)
To climb up Dunkery was our task - the reason why, we forgot to ask.
We reached the summit at dawn of day, then down to the woods we made our way.

Deep in the forest something stirred. We saw it at once - a Very Rare Bird!
Its breast was red and its back blue-grey and we saw a green rump as it flew away.
White wing-bars gleamed as it sped along and it uttered a *most* peculiar song.
"An Arctic Tern, do you suppose? We'll ask Bernard King, because he knows."

When we described its curious song, George Sweet said he would come along.
But tho' he listened with might and main, our bird was never heard again.
When we opened up our Picture Book to run it down by hook or crook,
Chadwick and Wright were very rude: "Try Andalusian Hemipode!"

We put the problem to Harry Neal, who thought it might be a Green-winged Teal.
Ray Poulding said, "If the light was dull, it could be a third-year Black-headed Gull."
At last we settled on Bearded Tit, but Howard Davis rejected it.
"A Bearded Tit goes Zing-Zing-Zing but you say your bird went Ting-a-Ling-Ling,"

Really, these experts make one yelp! They never give one any help,
Yet if one of *them* had seen the bird the last of it we'd ne'er have heard!
So now we've bought a Flower Book and botanize along the brook.

Comparison of bird life on the River Avon and Bristol Docks, January to May 2006

Alison Leaf,
11, Cornwallis Avenue, Bristol BS84PP.
alison_leaf@hotmail.com

Introduction

This study was undertaken as a dissertation project for the Certificate Course in Wildlife Biology run by Bristol University. The course lasts for two years and consists of four modules, covering a wide range of topics of biological and ecological interest. Seventy-five percent of marks for the final module are awarded for a dissertation of up to 10,000 words, involving a piece of original research. I chose to study birdlife on two parallel waterways in inner-city Bristol during a five-month period from January to May 2006.

Birds are the most obviously abundant wildlife in urban areas and are good indicators of 'environmental health'. Bristol City Council Sustainability Update is produced annually as part the city's Biodiversity Action Plan and includes birds as key biodiversity indicators (Bristol City Council, 2001-2005). All birds require access to water to a varying extent, and the parallel waterways of the River Avon and Bristol Docks provide important habitats. Although in close proximity to one another, they have different biological and physical characteristics. I was interested to explore how this affects the diversity and population numbers of birds encountered on each site.

The 'null hypothesis' was that there would be no difference in either variety of species or numbers of birds seen between the two sites.

Method

Parallel 1km transects were identified on each stretch of water. 'The River' included the stretch of the 'New Cut' extending 1 km south from the bifurcation of River and Docks, just beyond Brunel Way. The limits in width were Cumberland Road on the north side and Coronation Road to the south. This transect was walked on the west bank (cycle track). 'The Docks' included the stretch of the Floating Harbour from Brunel Way to SS Great Britain. The width included walkways on either side and adjacent buildings and gardens, if in sight of the water area. This transect was walked on the east bank. Each transect was surveyed twice each month. In order to minimize bias (Bibby 1992) the following rules were adopted:
All site visits should be done in the morning starting between 0900 and 1000. The order of first site visited would be alternated. Surveys would not be carried out in heavy rain or strong wind. The duration of visit would be the same for each site

Only birds that were seen and confidently identified were included. If there was doubt and a suitable photograph could be taken, identification was confirmed later with reference to RSPB Handbook of British Birds (Holden and Cleeves, 2002).
Birds were included if on the water, or on land within transect limits (including on buildings or trees), or if in flight below the level of the tops of surrounding trees and buildings. Key habitat features were identified. Note was made of features which could provide shelter or foraging opportunities and those which may act as threats or deterrents.

Results

1. Species diversity

Twenty-five different species of bird were identified – twenty-two on the River and seventeen on the Docks. There were eight species seen only on the River and three seen only on the Docks, while fourteen species were seen on both sites (Table 1). The median number of species seen on each visit was 10 on the River (range 7-13) and 8 on the Docks (range 7-10). Seven different orders of birds were represented – including sixteen families. The order *Passeriformes* showed greatest diversity, with fourteen different species identified in nine families. Thirteen of these species were seen on the River and eight on the Docks.
Statistical analysis, using 2-tailed Mann-Whitney U test, (Bland M 1987) showed a significantly greater number of species on the River.

2. Population numbers

On the River, the median bird count was 63 (inter-quartile range 48–72), while on the Docks, median bird count was 52 (inter-quartile range 27–73). This was not found to be significantly different on statistical analysis. The number of birds seen on each visit varied (Figure 1). There was a trend towards lower bird counts in windy conditions.

3. Frequency of sightings

Of the fourteen species seen on both sites, three were seen on all visits: Feral Pigeon, Lesser Black-backed Gull and Mallard. A further eight were seen on between five and nine occasions: Blackbird, Black-headed Gull, Crow, Blue Tit, Magpie, Wood-pigeon and Cormorant. Those seen on both sites, but on fewer than five occasions, were Starling, Jackdaw and Pied Wagtail.
Birds seen on River only are listed in Table 1. All eight species were seen on between 1 and 5 occasions. Of those three species seen only on the Docks – Mute Swans were seen on five occasions, while Dunnock and Moorhen were each seen twice.

4. Patterns of observation over five month period

Of the species not seen on every occasion, most were seen sporadically throughout the study period. Some, however, exhibited distinct patterns. The most marked of these were Black-headed Gulls which, as they are winter visitors to the region, were not seen after March 9th. Following their departure the number of Lesser Black-backed Gulls, some of whom winter in Spain, increased, and Herring Gulls began to claim their breeding sites in the city centre. (Figure 2). It was interesting that the total gull biomass was fairly constant at around 40kg, except in March when it halved (Fig 3).

5. Habitat assessment

Both sites contained bridges and buildings which could be used as roost sites. The River has considerably greater area of grass, trees and shrubs, and also significant area of mud flats at low tide. One birdfeeder was seen in the Dock area, which also had some small areas of grass in gardens and several hedgerows. Similar numbers of people were encountered on both sites, and a cat was seen once on each site.

Discussion

There was significantly greater species diversity on the River than on the Docks, however the total number of birds seen on each site was not different. The null hypothesis was thus rejected for the first part of the study question and accepted for the second.

The greater species diversity on the River was not surprising as there is a greater amount and greater variety of suitable habitat for birds in the River area. The greatest difference was in the variety of species of the order Passeriformes, of which thirteen were seen on the River, compared to eight on the Docks. This suggests a greater variety of niche opportunities for these smaller birds on the River. It is likely that the overall diversity was underestimated as birds were only included if seen. On occasions bird song was heard but no bird seen. In addition, the transects were only walked on one side of each waterway, so birds on the opposite bank may have been missed, and this would have been particularly relevant for smaller birds. The total number of different species seen was less than has previously been reported on the 'New Cut' - 'over 30' mentioned in the leaflet 'Discovering Wildlife on the Avon New Cut' (FrANC), and 35 listed in a previous Proceedings (Bland 2006). These surveys presumably included the whole length of the 'New Cut' – approximately 3km - and birds may have been identified by song as well as sight. The information was collected over a longer period of time (2005-6) and from a variety of sources. Observer experience probably also played a role.
There was no significant difference in the total number of birds counted on each site on each visit, suggesting that the 'trophic value' of each site is similar. This was rather surprising as the River area was felt to contain not only greater habitat diversity but greater areas of grass, trees and shrubs.

Factors which were considered when exploring the variation in total bird counts throughout the survey included weather and tide. The study was designed to minimise weather effects by avoiding wet or very windy days, however due to time constraints some surveys were carried out in a moderate breeze. No clear pattern could be detected, however the windy weather in March might have been responsible for the relatively low overall counts and the low gull counts. There was a general trend for lower bird counts in the later months.

The birds encountered were all species which are commonly seen in the UK. All are dietary generalists, feeding on insects, larvae, small crustaceans and other invertebrates, as well as seeds and fruit, and for the larger birds, small mammals, fish and household scraps.

One species, which was noted because it was absent, was the House Sparrow, *Passer domesticus,* particularly as this species was found to be present in 80% of Bristol Gardens in the 'Bristol Bird Watch' of 2004, and the Avon Breeding Bird Survey of 2004 showed a slight increase in numbers (Bristol City Council, Sustainability Report, 2005).
There has been a recent and dramatic decrease in populations of House Sparrows in Western Europe, as summarised by Wilkinson (2006), and this highlights the importance of monitoring populations of common birds. House Sparrows tend to live in urban gardens, and prefer those with native bushes and shrubs which provide fairly dense cover (Wilkinson, 2006). It is possible that the gardens in my study area were too exposed. In a previous report of House Sparrow densities in Bristol populations were found to correlate negatively with numbers of Feral Pigeons, Magpies and Carrion Crows (Bland R, 1998). As these species were all prevalent in both my study areas this may have been a further factor leading to the absence of sparrows.

The birds for which the most distinct patterns were seen were the gulls: with complete disappearance of Black-headed Gulls in March and a slight increase in numbers of Lesser Black-backed Gulls and Herring Gulls in the later months. This suggests that the Black-headed gulls breed elsewhere, while Lesser Black-backed and Herring Gulls breed locally. The greater body weight of the latter two gulls meant that the total 'gull mass' remained relatively constant throughout the study period. The nadir in March may have been due to windy conditions noted on these two visits or, alternatively, to a 'transition' period between different gull groups.

Conclusions and significance

My survey revealed that these neighbouring water habitats in central Bristol do support a significant and diverse population of birds. Although the majority of birds were relatively common, sightings of species such as Goldfinch and Common Sandpiper provide interest for amateur bird-watchers, as well as opportunities for education on bio-diversity.

A study in Northumbria (Dixon, 2005) showed that school-children's baseline knowledge about birds was poor. This improved when they were asked to carry out surveys of garden birds, and they were then able to contribute mature and appropriate suggestions about wildlife management. Parents' knowledge also increased. There is already significant community involvement in this area – with organisations such as Bristol Living Rivers Project (housed within the 'Create Centre') and FrANC, and the location is very accessible. Opportunities for educational visits are therefore considerable, but caution must be exercised to ensure that birds are not intimidated by excessive disturbance.

A greater diversity of bird species was found on the River, however both areas might benefit from habitat management aimed at attracting more birds. While an increase in the populations of gulls, feral pigeons and crows may not be welcome, strategies to increase the number and diversity of some of the smaller or less common birds would be. This could include planting of more native trees and shrubs, greater density of shrubs within gardens on the Docks, and the re-introduction of areas of grass and reeds on the edge of the Docks, which might encourage breeding of Mute Swans and Moorhens. Increasing the amount and diversity of hedgerows would also encourage more birds.

Finally, it is important to note, that as well as providing important habitat for birds, plants and invertebrates, these water courses form important wild-life corridors – both for birds and for other species such as bats, and this also emphasizes the importance of maintaining and understanding their ecology.

Table 1: Distribution of bird species seen on the River Avon and Docks, January to May 2006

Common name	Scientific name	River and Docks	River only	Docks only
Blackbird	*Turdus merula*	√		
Black-headed gull	*Larus ridibundus*	√		
Blue tit	*Parus caeruleus*	√		
Common sandpiper	*Actitis hypoleucos*		√	
Cormorant	*Phalacrocorax carbo*	√		
Crow	*Corvus corone*	√		
Dunnock	*Prunella modularis*			√
Feral Pigeon	*Columba livia*	√		
Goldfinch	*Carduelis carduelis*		√	
Great tit	*Parus major*		√	
Grey heron	*Ardea cinerea*		√	
Grey wagtail	*Motacilla cinerea*		√	
Herring gull	*Larus argentatus*	√		
House martin	*Delichon urbica*		√	
Jackdaw	*Corvus monedula*	√		
Lesser black-backed gull	*Larus fuscus*	√		
Magpie	*Pica pica*	√		
Moorhen	*Gallinula chloropus*			√
Mute swan	*Cygnus olor*			√
Pied wagtail	*Motacilla alba*	√		
Robin	*Erithacus rubecula*		√	
Starling	*Sturnus vulgaris*	√		
Wood pigeon	*Columba palumbus*	√		
Wren	*Troglodytes troglodytes*		√	

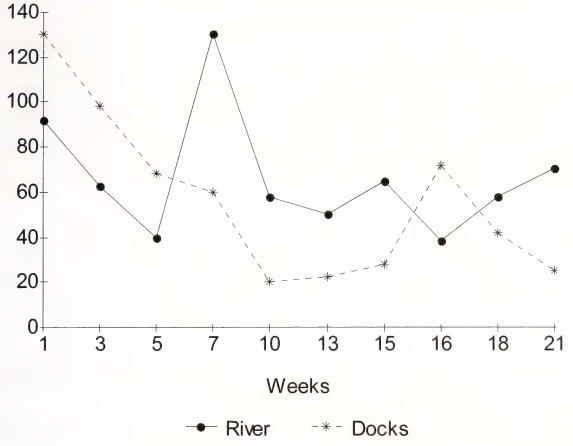


Figure 1 Number of birds counted on each site on each visit from January to May 2006

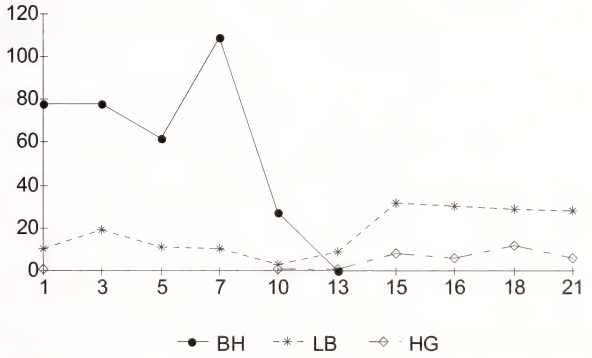


Figure 2 Counts of three gull species over 5 month period January to May 2006

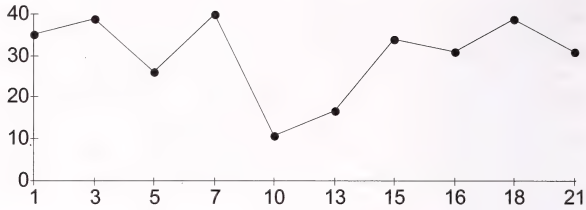


Figure 3 Total Gull Biomass (KG) on each visit.

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A record of the liverworts of the Avon Gorge, Bristol

Compiled by C M Lovatt, 2006

Introduction

The following record is compiled from published and herbarium sources, with a few field records. The original compilation was made, mainly in 1980, in an interleaved copy of the Census Catalogue of British Hepatics, (Paton 1964). It was summarised in a preliminary checklist of liverworts and mosses distributed at the British Bryological Society (BBS) meeting in Bristol in 1980.

The following record uses the same underlying records but updates the nomenclature to that in the latest vice county Census Catalogue, Blockeel and Long (1998), using where necessary the 1981 Census Catalogue of Corley and Hill.

Because the record is a compilation, it is likely to contain some errors. However, the principal sources are essentially reliable. There will also be omissions, including common species, as some sources concentrated on the more interesting species or better known places, whereas only some aimed at any completeness. As a result of habitat change, for example the loss of heathland on the Downs by the mid to late 19th Century, some species will never have been recorded at all, and a small number of recorded species may be extinct.

The list would benefit from the addition of current records and habitat notes where possible, as well as an expert review before it can be published. English names can be added from the new standard list. A similar record of mosses will be drafted in due course.

Principal sources

There are a few records of hepatics from mid 19th Century herbaria, collected by G.H. K. Thwaites, C. E Broome, and evidently W. Mitten. Miss Atwood's collections which surfaced at Leicester Museum in the 1960's seem to be confined to the mosses.

The earlier hepatic floras of Gloucestershire (Reader, 1885 and Knight 1920) and Somerset (Watson 1920) have relatively few records for their respective sides of the Avon Gorge. The Bristol University undergraduate survey of the Avon Gorge bryophytes by Margaret Pring (1954) is an ecological survey and it is not always possible to determine which of her sites had any given species.

G. W. (George) Garlick made an extensive collection of bryophytes in the period 1955-1958 and the 839 packets, in shoe boxes, were later donated to Bristol

University. Presumably they were moved with the vascular plant herbarium to the Museum in the early 1990's. Many were checked by experts.

On 27 October 1963, 25 members of the BBS made a foray in Leigh Woods, with A.J. Willis, R. M. Harley, G.W. Garlick and P. J. M. Nethercott apparently leading, and E. F. Warburg and many other well known bryologists present. Over 110 species were recorded, and several were new vice county records. The list, published by Willis in the 1964 Proceedings of the Bristol Naturalists Society, was intended to be as complete as possible for the areas visited, Nightingale Valley, the Towpath and the six numbered quarries.

The North Western Naturalists Union under M. Crundall made a follow-up foray on 1 March 1980 and confirmed the persistence of many of the BBS records.

Mrs Joan Appleyard's "A Bryophyte Flora of North Somerset" was published by the BBS in 1970. Her unpublished "more detailed account" of some records (the 'Supplement') is dated 1975 and her list from the Clifton side of the Avon Gorge (mainly the Gully and near the Observatory) was kindly provided to CML in a letter dated 25 May 1979.

Format of record

The full species name from the 1998 checklist is given. The reference to the Paton list (the 1964 Census Catalogue, not her recent Liverwort Flora) is intended to act as a bridge to the species names then used, but also to facilitate access to the underlying compilation of records.

Following the long established standard form for botanical recording in the Bristol area, G and S refer to the Gloucestershire (Clifton or vice county 34) side and the Somerset (Leigh Woods or vice county 6) side of the River Avon and Avon Gorge respectively. On a few occasions, the initial U has been used for unlocalised Avon Gorge records.

The records are listed chronologically for each side of the Gorge with minor exceptions where a later record confirms an earlier one. Rarely a few comments are added, when the compiler's knowledge and access to information has allowed.

Statistical analysis

	Clifton side	**Leigh Woods side**	**Total**
On both sides	16	16	16
Clifton side only	2	-	2
Leigh Woods side only	-	22	22
Known total	**18**	**38**	**40**
Unallocated			**2**
Total			**42**

The Leigh Woods side includes damp ancient woodland whereas the Clifton side was historically dry grassland and cliffs. The Leigh Woods side has also been better recorded than the Clifton side. The published sources and foray lists mostly included only about ten species each, but Garlick's explorations were wider and were made over a longer period, in an area where he also recorded the vascular plant flora in some detail. His herbarium therefore is more than twice as fertile as the other sources.

Catalogue of liverworts

Trichocolea tomentella (Ehrh.) Dumort.
Paton 28.1
S. Leigh Woods, 1923, Gibbons, NMW, cited by Appleyard.

Lepidozia reptans (L.) Dumort.
Paton list no. 31.2
S. Quarries, Leigh Woods, 1963, BBS Excursion.

Calypogeia fissa (L.) Raddi
Paton list no. 33.4
G. Sandy soil in woodland near bottom of Bridge Valley Road, 1956, Garlick. Clifton side of Gorge, Appleyard.
S. Leigh Woods, 1847, Broome, as *Jungermannia trichomanis* but presumably belonging here. Quarry, top of Nightingale Valley, 1954, Pring. Leigh Woods plateau, 1957, Garlick. On the ground, Nightingale Valley, 1963, BBS Excursion.

Calypogeia arguta Mont. & Nees
Paton list no. 33.7
G. Clifton side of Avon Gorge, 1980, Crundall.
S. Leigh Woods, 1876, A. Ley as *Jungermannia divaricata,* according to Knight, cited by Watson. On acid soil in woods (S?), Avon Gorge, 1954, Pring. Sandy path, Leigh Woods, 1956, Garlick, conf. Warburg.

Cephalozia bicuspidata (L.) Dumort.
Paton list no. 63.2
G. Sandy soil in Gully and on soil, Great Fault, 1956, Garlick.
S. Leigh Woods, 1847, Broome. Sandy path, Leigh Woods, 1956, Garlick. On wood, Nightingale Valley, 1963, BBS Excursion, and again in Nightingale Valley, 1980, NWNU Excursion.

Nowellia curvifolia (Dicks.) Mitt.
Paton list no. 65.1
S. On fallen rotting timber, Nightingale Valley, discovered independently by Nethercott (in 1962?) and by C. E. Risdale and members of the 1963 BBS Excursion. Still there but more extensively, and also in Paradise Bottom, 1977, Nethercott (BB 1977).

Cephaloziella divaricata (Sm.) Schiffn.
Paton list no. 62.9
S. Leigh Woods, 1904, Read, under *Cephaziella byssacea*, marked ! by Watson. Leigh Woods plateau, 1957, Garlick.

Lophozia ventricosa (Dicks.) Dumort.
Paton list no 34.1
U. On acid soil in woods, 1954, Pring.

Leiocolea badensis (Gottsche) Jorg.
Paton list no 35.2
S. A packet collected as *L. turbinata* from a moist slope in quarry, Leigh Woods, thought by Garlick to be a mixed gathering with some *L. badensis*.

Leiocolea turbinata (Raddi) H. Buch
Paton list no 35.1
G. On damp calcareous soil, the Gully, 1957, Garlick. Clifton side of Gorge, Appleyard. Also at Bristol, 1843, Thwaites, according to Knight.
S. Damp calcareous slope, Quarry 2, 1956, Garlick, and another packet from a moist slope in quarry, Leigh Woods, thought by him to be a mixed gathering with *L. badensis*. On wood, Nightingale Valley, 1963, BBS Excursion. Towpath under Leigh Woods, 1980, NWNU Excursion.

Jungermannia atrovirens Dumort.
Paton list no. 46.1
S. On soil, grassy slope, Leigh Woods, 1956, Garlick and another packet, also on soil, SW corner of Quarry 4. Nightingale Valley, 1957, Appleyard. Quarries, Leigh Woods, 1963, BBS Excursion, and reported with perianths in their Transactions for 1964, 4:754.

Jungermannia gracillima Sm.
Paton list no. 46.8
S. Leigh Woods, 1900, Read in Watson. On the Towpath and in quarries, 1963, BBS Excursion.

Nardia scalaris Gray
Paton list no. 48.2
S. Bank by forestry road, Leigh Woods, Appleyard Supplement.

Diplophyllum albicans (L.) Dumort.
Paton list no. 69.1
S. Sandy path in Leigh Woods, 1956, Garlick. Mentioned by Willis as present in Leigh Woods in the report of the 1963 BBS Excursion but not included in the lists.

Scapania nemorea L. Grolle
Paton list no. 70.13
S. Track in Leigh Woods, E.W. Jones in BB 1947. Sandy paths in Leigh Woods, Garlick, 1956.

Scapania aspera M. & H. Burnet
Paton list no. 70.11
G. Rocky limestone slope on the south side of the Gully, 1956, Garlick. Amongst *Carex humilis* grassland there, 1979, Lovatt.
S. Track in Leigh Woods, E.W. Jones in BB 1947. Sandy paths in Leigh Woods, Garlick, 1956.

Lophocolea bidentata (L.) Dumort.
Paton list no. 57.1 and 57.2 (*L. cuspidata*)
G. Great Fault on soil (as 57.1), 1956, mixed with *Cephalozia bicuspidata*.
S. Quarry at the top of Nightingale Valley and nearby on wood, 1954, Pring (as 57.2). Leigh Woods plateau, 1956, Garlick (as 57.2). Nightingale Valley, 1963 and 1980, BBS and NWNU Excursions (both taxa).

Lophocolea heterophylla (Schrad.) Dumort.
Paton list no. 57.3
G. Clifton side of Gorge, Appleyard.
S. Leigh Woods, 1847, Mitten in Broome's herbarium. On rotting stump, Leigh Woods, 1957, Garlick. Shown to Lovatt in Leigh Woods, 1979, by Garlick. Nightingale Valley, on wood, 1963, BBS Excursion, and 1980, NWNU Excursion.

Chiloscyphus polyanthus (L.) Corda.
Paton list no. 58.1
S. Nightingale Valley, on wood, 1963, BBS Excursion, and 1980, NWNU Excursion.

Chiloscyphus pallescens (Ehrh. Ex Hoffm.) Dumort.
Paton list no. 58.2
G. Steps leading down Gully, 1955, Garlick. Near Bridge Valley Road, 1957, Garlick. Clifton Side of Gorge, Appleyard.
S. Leigh Woods, Watson, 1920. Sandy path, Leigh Woods, 1957, Garlick.

Plagiochila porelloides **(Torr. Ex Nees) Lindenb.**
Paton list no. 56.1a, *P. asplenioides* var. *asplenioides*
S. Leigh Woods, 1857, Hudd, BRISTM, a first vice county record, Appleyard. Nightingale Valley, 1963, BBS Excursion.

Plagiochila asplenioides (L.) Dumort.
Paton list no. 56.1b, *P. asplenioides* var. *major*
S. Leigh Woods, as var. *major* forma *subintegerrima*, Watson 1920. Nightingale Valley, 1963, BBS Excursion.
There are also some unallocated or unrecorded varieties collected by Garlick: slopes of Quarry 5, 1956; Quarry 1 to plateau, 1957; tunnel mouth near river light, several. *P. britannica* Paton is not reported in v.c.6 in the latest Census Catalogue (1998).

Ptilidium pulcherrimum (Weber) Vainio
Paton list no. 27.2
S. On wood, Nightingale Valley, with *Nowellia curvifolia* and *Dicranum montanum*, 1963, BBS Excursion and BB 1963.

Porella platyphylla (L.) Pfeiff.
Paton list no. 73.3
G. Near Bridge Valley Road, 1957, Garlick, in a mixed packet.
S. On wood, Nightingale Valley, 1963, BBS Excursion, and 1980, NWNU Excursion. **U.** Recorded in the Avon Gorge, 1954, Pring.

Porella obtusata (Taylor) Trevis
Paton list no. 73.2
G. On rocks, Clifton Down, C. and N. Sandwith, BB 1943, as *Madotheca thuja*, new to Gloucestershire. According to the latest Census Catalogue (1998), it has not been seen in v.c.34 since the beginning of 1950.

Frullania dilatata (L.) Dumort.
Paton list no. 82.5
G. On tree trunk, Jacob's (Jack's) Hole, St Vincent's Rocks, 1957, Garlick.
S. Quarries, Leigh Woods, 1963, BBS Excursion.

Marchesinia mackaii (Hook.) Gray
Paton list no. 74.1
S. Leigh Wood, detected in herbarium material (presumably his own, NMW) by Knight, Report of the Botanical Section of the Somerset Archaeological and Natural History Society for 1923. Damp shady limestone, Nightingale Valley, 1957, and also vertical damp limestone valley beyond Nightingale Valley, 1958, Garlick.

Otherwise known in v.c.6 on Steep Holm, at Sand Point, Ebbor Gorge, Cheddar and Brockley Combe.

Microlejeunea ulicina (Taylor) A. Evans
Paton list no. 75.8
S. On oak tree by path just beyond Stokeleigh Camp, 1957, Garlick. In 1979, Garlick showed it to Lovatt on the trunk of a pollarded small-leaved lime at the edge of the Gorge slopes at the path junction immediately to the north of the camp.

Lejeunea cavifolia (Ehrh.) Lindb.
Paton list no. 75.1
G. The New Zigzag, 1956, and on rock, to the right of Bridge Valley Road, 1957, Garlick, perhaps the same place. Clifton side of Gorge, Appleyard.
S. Avon Gorge, 1954, Pring, including in the quarry at the top of Nightingale Valley. Nightingale Valley, 1956, Garlick, 1963, BBS Excursion and 1980, NWNU Excursion. Damp limestone valley beyond Nightingale Valley, 1958, Garlick.

Cololejeuenea rossettiana (C. Massal.) Schiffn.
Paton list no. 78.2
S. Leigh Wood, detected in herbarium material (NMW) by Knight, Report of the Botanical Section of the Somerset Archaeological and Natural History Society for 1923, a new vice county record. Subsequently mentioned in BB 1945, the report of the 1963 BBS Excursion and Appleyard, but apparently without having been found again.

Fossombronia caespitiformis De Not. ex Rabenh.
Paton list no. 20.5
G. On sandy soil in the Gully, 1956, Garlick.
S. Track in Leigh Woods, E.W. Jones and C. I. Sandwith, 1947, apparently the only Somerset site. Shown in the latest Census Catalogue (1998) as lacking any record after the beginning of 1950, but collected on a clay path in Leigh Woods (Forestry Commission end), 1956 by Garlick (subject to confirmation of specimen).

Fossombronia pusilla (L.) Nees
Paton list no. 20.8
G. The Gully, Durdham Down, 1956 (same date as specimen labelled *F. caespitiformis*), Garlick.
S. Track in Leigh Woods, E.W. Jones and C. I. Sandwith, 1947, apparently the only Somerset site. Shown in the latest Census Catalogue (1998) as lacking any vice county record after the beginning of 1950, but collected on a clay path in Leigh Woods (Forestry Commission end), 1956 by Garlick (subject to confirmation of specimen).

Pellia epiphylla L. Corda
Paton list no. 14.1
U. In the Avon Gorge, 1954, Pring, in no more than two of six survey areas, and only occasional. Perhaps an error for *P.endiviifolia* as it is calcifuge. Pring's survey areas would have been more limestone dominated.

Pellia neesiana (Gottsche) Limpr.
Paton list no. 14.3
S. Paradise Bottom, Leigh Woods, Appleyard Supplement.

Pellia endiviifolia (Dicks.) Dumort.
Paton list no. 14.4
G. The Gully, Durdham Down, 1955, and on the ground in the Great Fault, 1956, Garlick. Clifton side of Gorge, Appleyard.
S. Leigh Woods, 1847, Mitten in Broome's herbarium and E. Armitage, BRIST, cited in Appleyard. Nightingale Valley, on trees or wood, 1963, BBS Excursion.

Aneura pinguis (L.) Dumort.
Paton list no. 12.6
S. Towpath and Damp calcareous slope, Quarry 2, 1956, Garlick. Quarries, Leigh Woods, 1963, BBS Excursion.

Riccardia multifida (L.) Gray
Paton list no. 12.2
S. Leigh Woods, 1847, Mitten in Broome's herbarium.

Metzgeria furcata (L.) Dumort.
Paton list no. 15.1
G. Clifton side of Gorge, Appleyard.
S. Avon Gorge, 1954, Pring, including a site on wood at the top of Nightingale Valley. Quarries, Leigh Woods and Nightingale Valley, on wood, 1963, BBS Excursion and 1980, NWNU Excursion.

Metzgeria conjugata Lindb.
Paton list no. 15.3
S. Leigh Woods, Appleyard Supplement.

Lunularia cruciata (L.) Dumort. ex Lindb.
Paton list no. 6.1
G. Woodland, sandy soil below Clifton Promenade, 1956, Garlick. Clifton side of Gorge, Appleyard.
S. Nightingale Valley, on wood, 1963, BBS Excursion and 1980, NWNU Excursion.

Reboulia hemisphaaerica (L.) Raddi
Paton list no. 4.1
G. St Vincent's Rocks and Durdham Down, Knight, 1920. On limestone, Observatory Hill and Jacob's (Jack's) Hole, St Vincent's Rocks, 1957, Garlick. Clifton side of Gorge, Appleyard.

Riccia sorocarpa Bisch.
Paton list no. 11.8
G. The slopes below Durdham Down, Knight, 1920. Path, the Promenade, 1955, shown to Garlick by C. I. Sandwith. Observatory Hill, 1956 Garlick. Rock, top of Gully by *Allium sphaerocephalon*, BBS field record 1980.
S. Rocky path, Stokeleigh Camp, 1958, Garlick.

Obituaries.

Professor D. H. Peregrine

Howell Peregrine, Emeritus Professor of Applied Mathematics at the University of Bristol and our President in 1974-75, died suddenly on March 20, 2007 after a short battle against cancer. He was born in Birkenhead, where his father was an engineer with Rolls-Royce. The family moved to Newcastle-on-Tyne and then to Hertfordshire, where he attended Hitchen Grammar School. His undergraduate training in mathematics was at Jesus College, Oxford, and his post-graduate training, in which he became an expert in the behaviour of fluids, was at Churchill College, Cambridge. After completing his doctorate in 1964, he joined the applied mathematics group at the Mathematics Department of the University of Bristol, where he worked for the rest of his life. His main field of interest was in all aspects of water waves, in any circumstances whatever, in which he gained an international reputation not only for theoretical studies but in their practical application to coastal structures. His academic career was remarkable for the sheer volume, as well as the importance, of his work. He published over 100 refereed research papers and many papers for conferences, and successfully supervised eight MSc and 26 PhD students. He appointed 29 research assistants to work with him on research projects, and many of these now hold senior academic or industrial positions. Also, since 1981 he had been an Associate Editor of the prestigious *Journal of Fluid Mechanics*, for which he processed over 50 research papers a year, seeking reports from three referees for each.

His long-time colleague and friend Emeritus Professor David Evans wrote of him: "…Until his untimely death, Howell continued to play a key role in maintaining and promoting the study of fluids and ensuring that Bristol remained one of the few centres of excellence in this discipline. His death is a great loss to fluid dynamics but the greater loss is of a unique individual who was held in great affection by his friends and colleagues world-wide."

All his life he was remarkably fit. He rowed at Oxford and was an active member of the Bristol Ariel Rowing Club until his young family, two sons and a daughter, arrived. He took great delight in them. He cycled to work from Westbury-on-Trym every day whatever the weather, and also maintained an allotment. He reached normal retirement age in 2004, when he was made Emeritus, but this made little difference to his rate of working. "…A highly successful event was held in July 2006 in Bristol, which attracted colleagues from around the world to a series of lectures in recognition of his contributions. At his insistence the word 'retirement' did not appear in the publicity." He gave a tutorial from his bed the day before his death.

Howell Peregrine joined this Society in 1966 and was soon active in its affairs. He served as President in 1974 and 1975; his Presidential Address, on river bores and especially the Severn Bore, was memorable for the quantity of water involved. He was actively interested in all branches of natural history, though perhaps chiefly in botany and geology, and in waterways. He was one of the senior BNS members recruited by the late H. G. Hockey as founding Trustees of the South Brecons Field Studies Centre Trust ("Glan-yr-Afon"), the origin later of our Hector Hockey Fund. We extend our sympathy to his family, including his grandchild.

S. M Taylor, Hon. Archivist, with information and quotations by permission from his University obituary by Professor David Evans.

Rachel Lee

Rachel Lee was a stalwart member of the BNS for most of her adult life. She became a member of Council in 1967, and served in several capacities including Vice-President and Circulation Secretary, and she was President from 1989-1991. But it was in leading and participating in field walks that she found her forte. She was what is now a rare breed, an all round naturalist who never specialised in any particular area of wildlife, but marvelled at every aspect of nature, and was never happier than when introducing others to wonderful sites that she loved. She took over the Field Committee in 1982 and ran it with immense enthusiasm and efficiency for twenty years. Under her leadership there were successful monthly coach trips to a huge range of sites spread widely across the country. Her willingness to give the time to effective organisation, including finding leaders for those she did not lead herself, checking the site, hiring the coach, chivvying members and ensuring no-one was left behind, ensured the success of the meetings. She had a formidable personality that never took no for an answer, and she is greatly missed by all.

R.L.Bland

Organisation.
At the AGM on Jan 20th Mr B Morris was elected President, Mr R Bland Secretary in succession to Mr B Frost, and Dr T Ewin, Miss A Morss and Dr M Pocock were elected as new members. Mrs A Hollowell resigned as Librarian. Later in the year Mr R Muston was co-opted. Miss R Cooper, Mr P Hilton, secretaries of the mammal group and botanical section, and Mr E Drewitt, president of the ornithological section, joined ex-officio. Membership stood at 544, and the treasurer showed that we had made a surplus of £1889 on our activities during the year 2006 and made grants totalling £850.

Grants The Hector Hockey Fund and the Society's Conservation fund are used every year to support local conservation and natural history activity. In 2007 total grants of £2820 were made as follows;-£120 was given to Mr J Tully for a survey of breeding birds in Southmead; £200 was given to Mr E Drewitt to enable attendance at an international conference on Peregrines.; £1000 was given to the AWT for the Folly Farm appeal which will be used to build an educational pond; £500 was given the British Trust for Ornithology to support its Atlas appeal; £1000 was given to the Gloucester Wildlife Trust's emergency flood appeal.

Library. The post of Hon Librarian remained empty, but the library committee opened the library and 27 members borrowed 152 books and journals in the course of the year. 8 new books were purchased at a cost of £86 and books and journals were donated by Mr F Peddle, Miss Rogers, Dr H Peregrine, Dr. D Cope, Mr. R Symes, Mr. D Warden, Mr. D Trump, Mr. D Wilson, Mr W Duckworth, Mr. N Wray (a video of the Botanic garden move) and Mr. M Evans. An Open day was held on Feb. 11 was visited by 13 people.

Meetings. In the course of the year there were 72 meetings held by the society, 43 of them field meetings mostly in the summer, and 29 indoor meetings. BNS members promoted natural history to a fresh young adult audience in 2007, by supporting the newly-launched University of Gloucestershire Wildlife Society. The students were welcomed as guests at our intriguing bat lecture, given by Mr J Flanders in January. Further support and expertise was exchanged during joint field visits - firstly to Leigh Woods, to learn to identify mosses, and later to the Cotswolds to discover Roman snails, limestone grassland plants, insects and industrial archaeology, escorted by the Friends of Leckhampton Common and Charlton Kings conservation volunteers. These links helped to promote the BNS and helped encourage new young people to become enthused about natural history.

Section reports
Botany. Mr P Hilton became secretary. The section held six indoor and 14 field meetings in a wide range of habitats including woodland, where Hencliff Wood

gave us a somewhat different flora from our local limestone woods being on acid soil. We offer surveys to interested landowners and spent an interesting time on the land close to Redding Pits following our visit there last year. We visited the new AWT reserve at Portbury Wharf and found 125 species, five which were firsts for VC6, including Corncockle and Corn Marigold. A meeting in the Cotswolds including Charlton Kings Common gave us a similar species total. Leigh Woods provides new Sorbus species as a result of Miss E Houston's meticulous work. Dr C Lovatt continued to produce a remarkable series of notes on previous botanists for the bulletin.

Geology. At the AGM Mr S Carpenter retired as President and was replaced by Dr Tim Ewin. The six indoor meetings included a talk on a Westbury Pliosaur, a fascinating talk about the aggregates industry and it's future in Britain and a talk on the best preserved dinosaur ever discovered in Britain. Our field meetings included a fantastic joint meeting with the South Wales Geological Society to the Westbury cement pits, a hands-on geology day at the Bristol to Bath cycle path and a special preview of a new complete dinosaur acquired by the Bristol City Museum and Art Gallery. Members were involved at the Rocky Road show in the Museum in February.

Invertebrates. Four indoor and four field meetings were held during the year. Attendance at the meetings was never excessive but always enthusiastic. The field meetings included visits to both National and Local Nature Reserves which contributed further to our knowledge of each site. Joint meetings with the Friends of Wick Golden Valley LNR generated larger attendance and were greatly appreciated.

Mammal There have been a series of very active field meetings, and the group has been asked to take over responsibility for the Avon Otter group. It has been involved in a national small-mammal trapping survey.

Ornithology. At the 2007 AGM Mr E Drewitt was elected president. During the year there were five lecture meetings, one members evening and 15 field meetings, which were reasonably well attended. Members continued to be active in a variety of field work including the national BBS, which covered 216 local squares this year, WeBS counts of waterfowl and waders, the Nest Record Card Scheme, the BTO Garden Birdwatch, Bristol Birdwatch, and the new BTO national Atlas.

Publications. Dr H Rose, editor of the Avon Bird Report produced a new larger format journal in December, and Mr R Bland published volume 66 of Nature In Avon in November. Mr D Davies maintained the exceptional standards of the monthly bulletin and Mr D Strawford maintained the succinct information on the website. A new Photo Site was set up by Mr R. Muston, and a wide range of photos was loaded on to it. At the end of the year it had to change its address to www.flickr.com/photos/bris_nats.

Archives Work has continued on collecting and classifying data. Aspects of electronic storage are being investigated. Information has been supplied for obituaries.

Publicity. The Society was represented at the Rocky Road show in the Museum in February, The Festival of Nature in June, the Botanical Garden Open day, Chew Valley Lake open day and the Rock and Fossil event in August, the North Somerset Environmental Day in September, and the Museum Green Market in November. A Press release was sent out in April.

Finance. The Society is on course to remain well within budget for the year in relation to its normal charitable activities. In addition interest of £1100 has been received to date and grants totalling £2,820 have been made. A bequest of £5,000 from the estate of the late Dr K Collins was received.

Records and monitoring. All wildlife records made by members were passed on to BRERC. The spring was the warmest since 1893, and as a result of a special effort the first flowering dates of over 400 plants were collected to assist in the process of monitoring the impact of changing weather conditions on wildlife.

Relations with other organisations. In the course of the year the Society was involved in the city's consultation on Waste Disposal, a conference on "Bristol, Green Capital", the Severn Estuary Partnership in June, consultation on the Bristol Core Strategy document, and the Bristol Parks Draft Strategy, and the proposal to set up a Friends of the Downs organisation. It was also represented at the Bristol City Council's Alien Weeds Forum. It helped to create the Bristol BAP, and was consulted by the South Gloucestershire BAP. As a member of the SECG it was involved in drawing up a clear statement opposed to the development of a tidal barrage on the Severn Estuary. Members were involved with the AWT Pondways initiative, and the Bristol Birdwatch scheme, and the monitoring of the new Avonmouth wind turbines.

Future Provisional plans were prepared for celebrating the Society's 150th anniversary in 2012 This would also be the centenary of JW White's Flora and the botanical section hoped to produce a fitting tribute. 2009 would be the centenary of the gift of Leigh Woods to the National Trust, and the society offered it help in celebrating this event.

Deaths In the course of the year two former Presents, Dr H Peregrine and Miss Rachel Lee, died. We also record the deaths during the year of long standing members JP Singer, I Langdon Davies, K Poole, D Milligan and M O'Leary.

Thanks. The Society is grateful for the help and support it received from the Earth Sciences Department, University of Bristol, and Mr Mark Moore, Headmaster of

Clifton College, for the use of their premises for meetings, and Ms. Kate Brindley, Director of Museums, Galleries and Archives, Bristol City Council, for continued support of the Society Library located within the City Museum & Art Gallery. It is also grateful to all those members of the society who gave so willingly of their time and energy in the course of the year to support the aims of the Society.

Bristol Naturalists'Society

Report of Library Committee for 2007

The Library Committee, (Mrs AM Wookey Chair, Mrs R Atkins, Mr RL Bland, Mrs P Gooding, Mrs AF Hollowell, Mr RG Symes, Mr B Tizard, Mr DPC Trump, Mr J Webster, Mr DA Wilson, and by invitation Mr SM Taylor (archivist)), met on four occasions in 2007 and ensured that the Library was open in every week of the year. Mrs Hollowell continued to advise the Committee in the absence of a Librarian. Publicity for the library was maintained by regular reports in the Bulletin of new accessions, and by a successful open day especially aimed at new members. We would like to give special thanks to David Wilson who is retiring from the committee after at least 25 years.

The Library committee completed the year's work within the budget agreed by Council. The computer database contains details of all the journals held, and of over 1800 books, and is searchable by key word. During the year 28 members (37 in 2006) made 251 (190) visits to the Library and borrowed 218 (203) items. Members of the Museum staff continued to make use of our Library. 86 journals were received by subscription or exchange, 11 new books were purchased, and 26 books or pamphlets, and 2 videos were donated and added to the library stock, and a number of others have yet to be formally acquisitioned. Special name plates were added to donated items. For these donations we are indebted to Dr W Duckworth, Mr M Evans, the estate of the late Prof DH Peregrine, Mr R Rowe, Mr RG Symes, Mr D Trump, Mr D Warden, Mr D Wilson, Mrs S Kelly, and Mr F Peddle.

All members of the committee are thanked for their assistance in 2007.

Ann Wookey, Chair.

Bristol Naturalists' Society,

Ornithology Section Report, 2007

In 2007 we elected a new president, Ed Drewitt, who took over from Richard Bland who had done excellent work for us for some time. We held were 5 lecture meetings, one 'members' evening', a new venture for us, and 15 field meetings The meetings were reasonably well attended - the numbers at field meetings are always very weather dependant. We are very grateful to all our speakers and field meeting leaders.

Indoor Meetings

January 19th	Ed Drewitt	The Diet of Peregrines
February 7th	David Balance	Birds of Somerset
March 21st	Ralph & Brenda Todd	Birds of the Southern USA
October 10th	Prof Pennycuick	Soaring birds:
November 14th	Dr Rob Thomas	Birds and Global warming
December 14th	Members' evening.	

Field Meetings

Jan 13th	Somerset Levels	Mike Johnson
Feb 24th	West Sedgemoor	Mike Johnson
March 25th	Forest of Dean	Ed Drewitt
April 17th	Leigh Woods	Richard Bland
April 26th	Stockwood	Paul Farmer
May 10th	Frome Valley	Richard Bland
May 20th	Somerset Levels	Mike Johnson.
May 31st	Eastwood Farm	Richard Bland
June 5h	Blagdon	Mike Johnson
June 13th	Stock Hill	Ed Drewitt
July 4th	Marshfield	Pauls Farmer & Chadwick
September 1st	Severnside	Brian Lancastle
October 14th	Migration Watch at Aust,	Richard Bland
November 17th	Cheddar Res	Mike Johnson
December 27th	Chew	Paul Farmer

Members continue active in field work of various kinds. The national Breeding Bird Survey, the Waterways Survey, the Heronry Survey, WeBS counts of Waterfowl and Waders, the Nest Record Card Scheme, and the National Ringing Scheme. They also participated in BTO Garden Birdwatch, Bristol Birdwatch, and the society's own 30 year old Winter Garden Survey. They continued to monitor wintering Blackcap and Chiffchaff populations, and winter populations through the Winter Bird Counts.

Involvement with Local Authority.
The results of BBS work is sent to the four Unitary authorities Environmental departments, and in Bristol is used as part of the annual Quality of Life audit. Bristol Birdwatch is administered by the Avon Wildlife Trust, and supported by Bristol City Council.

Bristol Naturalists' Society

Statement on Financial Activities to Dec 31 2007

	2007	2006
INCOME (Incoming resources)		
Membership Subscriptions	7,431.50	7,336.50
Gift Aid	1,128.67	1,092.38
Bequests & Donations	5,737.58	461.31
Trading	198.54	170.94
Library Sales	0	10
Interest Received	1,898.89	1,421.30
Total	16,395.18	10,492.43
EXPENDITURE		
(A) Direct Charitable		
Meetings	922.83	917.73
Books & Periodicals (Library)	715.98	646.11
Proceedings Production	1,745.00	1,907.00
Avon Bird Report	1,440.00	1,675.00
Bulletin Production	1,527.67	1,202.40
White Sheet Production	96	74.75
Distribution Costs	1,117.03	1,003.29
Subscriptions	86	85
Publicity	50	151.93
Grants Awarded	2,820.00	850

Total	10,520.51	8,513.21
(B). Administration		
Print & Stationery	278.14	117.61
Postage & telephone	177.64	149.11
Software	0	25
Hardware	0	139
Insurance	155.62	180.23
Audit	0	0
Miscellaneous	130.65	329.27
Total	742.05	940.22
Operating Surplus (Deficit)	5,132.62	1,039.00

Balance Sheet as at 31 December 2007

	Notes	2007	2006
ASSETS			
Current Assets			
Prepayments	1	515.85	510.84
National Savings	2	11,603.09	11,382.70
Bank (Lloyds)		2,238.06	3,610.23
Bank (CAF)	3	31,167.69	24,810.84
Bank & Cash (Sections)	4	291.81	403.27
		45,816.50	40,717.88
LIABILITIES			
Creditors			
Subscriptions Received in Advance		162.5	196.5
		162.5	196.5
Total Assets less Total Liabilities		45,654.00	40,521.38
CAPITAL			
General Fund	5	12,646.28	11,201.96
Designated Funds			
Milton		6,103.07	6,136.88
Memorial		17,224.28	13,959.99
Conservation		467.06	441.99
Library		2,510.98	2,392.83
Ornithological Special Fund		1,202.31	1,141.91

Restricted Funds		
Hector Hockey	5,500.02	5,245.82
	45,654.00	**40,521.38**

Notes

1 Prepayments

Meeting Rooms	250
Insurance	64.85
Periodicals	201

2 National Savings

Hector Hockey and Milton funds, restricted		
Opening Balance	5,245.82	6,138.88
Interest Received	254.2	286.19
T/f to Lloyds (Grants)	0	-320
Closing Balance	**5,500.02**	**6,105.07**

3 CAF

	General Fund	Memorial Fund	Conservation Fund	Library Fund	Special Fund
Opening Balance	6,874.12	13,959.99	441.99	2,392.83	1,141.91
Interest Received	388.94	764.29	25.07	118.15	60.4
Bequest		5,000.00			
Transfers (Grants)	2,500.00	-2,500.00			
Closing Balance	**9,763.06**	**17,224.28**	**467.06**	**2,510.98**	**1,202.31**

4 Sections

	Ornithology	Botany
Opening Balance	166.93	236.34
Grant from General Fund	185	0
Interest Received	0	1.65
Transfer to General Fund	0	-237.99
Net Expenditure	-60.12	0
Closing Balance	**291.81**	**0**

5 General Fund

Opening Balance			**Represented by:**	
Bank (Lloyds)	3,610.23		Paid from Lloyds A/c	-16,347.68
Bank (CAF)	6,874.12		Net section expenditure	-58.47
Sections	403.27		Paid into Lloyds A/c	14,975.51
Prepayments	510.84		Transfer from Sections	-237.99
Creditors	-196.5	11,201.96	Transfer to Sections	185
			Interest received	388.94
Closing Balance			Transfer (funds to CAF)	2,500.00
Bank (Lloyds)	2,238.06		Debtors movement	5.01
Bank (CAF)	9,763.06		Creditors movement	34
Sections	291.81			
Prepayments	515.85			
Creditors	-162.5	12,646.28		
Movement		**1,444.32**		**1,444.32**

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INSTRUCTIONS FOR AUTHORS

The editor welcomes original papers or short notes on the natural history of the greater Bristol region for consideration for publication in the Proceedings. All papers for consideration should reach the editor by the end of November for publication in the following year. All Society Reports and Biota should reach the editor by the end of February in the year of publication.

Whenever possible, text should be submitted electronically in Word. The data for graphs should be sent in Excel, and any other illustrations should be submitted electronically.

The Editor welcomes digital photos of any natural history subject taken in the region, whether relevant to an article or not. They should be of the largest pixel size possible.

References should be listed at the end of the text, in alphabetical order of the first author's name, and should take the following form (with book and journal title in italics and first line hanging).

***Book*:** Author (Date). *Title*. Place of publication: Publisher. - e.g.

Clapham, A.R., Tutin, T.G. and Warburg, E.F. (1952) *Flora of the British Isles*. Cambridge at the University Press.

***Paper*:** Author (Date). Title. *Journal Name*, volume , page nos.- eg

Ross, S.M. (1986). West Sedgemoor: its peat stratigraphy. *Proceedings of the Bristol Naturalists' Society*, **44**, 19-25.

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Rerum cognoscere causas - Virgil

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